

Safe sedation in general practice

What is 'safe sedation' in general practice?

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This article focuses on sedation for procedures outside the operating room (OOR).

Sedation providers come from a range of backgrounds and unlike anaesthesia providers often receive their training in the form of 'see one, do one, teach one'. This might have been sufficient in the days when diazepam and pethidine were used to immobilise patients for procedures and left them sleeping for many hours thereafter. However, modern-day drugs are potent, rapid-acting and have a predictable offset. They are often controlled by target-directed infusion pumps, thereby elevating sedation to a science in its own right.

Sedation is used daily for a wide variety of painful and non-painful diagnostic and therapeutic procedures. General practitioners often use sedation to ensure patient comfort during procedures performed in the office. However, general practitioners also act as sedation providers for other disciplines, like emergency medicine, gastroenterology, radiology, dermatology, dentistry, plastic surgery and others.

There are several pieces in the sedation puzzle that fit together to ensure safe sedation. Even though the main piece in the puzzle is the patient, the absence of any of the other pieces may be detrimental to patient safety. The following are discussed: the location, the sedation provider, the operator (procedure provider), the procedure, the sedation, the patient and aftercare.

The location

General anaesthesia is usually performed in a strictly controlled environment where guidelines and protocols are in place

to prevent mishaps and ensure patient safety. Sedation, on the other hand, can be performed in any location where the need arises, often with limited room and outdated monitoring systems.

Sedation is used daily for a wide variety of painful and non-painful diagnostic and therapeutic procedures.

Considerations include:

- Does the location meet the requirements for safe sedation practice? What are these requirements?
- Is there sufficient room to manage emergencies, e.g. performing cardio-pulmonary resuscitation (CPR)?
- Is the monitoring on par with the nature of the procedure and the level of sedation used? (What monitoring is available?)
- Are there qualified personnel:
 - To assist with the sedation and procedure?
 - To assist during an emergency?
 - To assist patients' recovery?
 - To assist with a transfer?
- Are resources in place to manage medical emergencies like bronchospasm, laryngospasm, cardiac arrest and anaphylaxis? (What resources?)
- Is there a facility nearby and transport available in case of an unforeseen transfer?
- Are there plans in place for power outages, equipment failure or fire?

The sedation provider

Like anaesthesia providers, sedation providers need training in pre-procedure assessment of patients, drug dose and effect relationships, monitoring of patients,

management of emergencies, recovery and aftercare. Sedation providers need to update their emergency and resuscitation skills and protocols regularly.

Considerations include:

- Does the sedation provider have a thorough knowledge of the drugs being used?
 - Time to onset, time to peak effect, and duration of effect?
 - Possible synergistic effects?
 - Possible delayed adverse effects?
- Is the sedation provider trained to:
 - Monitor the patient under sedation, i.e. level of sedation; airway patency and adequacy of breathing; heart rate and blood pressure; patient perception of pain
 - Maintain and protect the airway throughout the procedure
 - Manage unanticipated responses to drugs
 - Recognise an undesirably deep level of sedation
 - Manage and rescue patients who enter sedation levels deeper than intended
 - Treat medical emergencies
 - Decide when to discharge the patient?

The operator

The operator and sedation provider share the responsibility of ensuring that the facility, personnel, equipment, monitors and available drugs fulfil the requirements for the safe completion of both the sedation and the procedure.

In general practice the sedation is often provided by the person performing the procedure – the operator-sedationist. The operator-sedationist may only use simple sedation techniques (see 'The sedation' below).

Safe sedation

Considerations include:

- Is the operator knowledgeable about which patients are suitable for sedation?
- Is the operator aware of the limitations of sedation and will they be respected?
- Is the operator trained and experienced to help in an emergency – ALS (advanced life support), ACLS (advanced cardiac life support)?

The procedure

The nature of the procedure will largely determine what the sedation will entail. Even though procedures performed in general practice are usually minimally invasive and pose little risk to the patient, they are often painful and may necessitate the administration of sedatives and systemic analgesics. This will increase the risk, since most adverse events in sedation are due to drug-induced loss of airway and depression of spontaneous breathing. These events are more prevalent if a combination of drugs is used.¹

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Considerations include:

- Nature of procedure:
 - Is the procedure appropriate for OOR?
 - Does the procedure warrant a pre-operative patient consultation?
 - Is there a chance of blood loss?
 - Does the procedure warrant a possible overnight stay?
- Pain:
 - How painful will the procedure be?

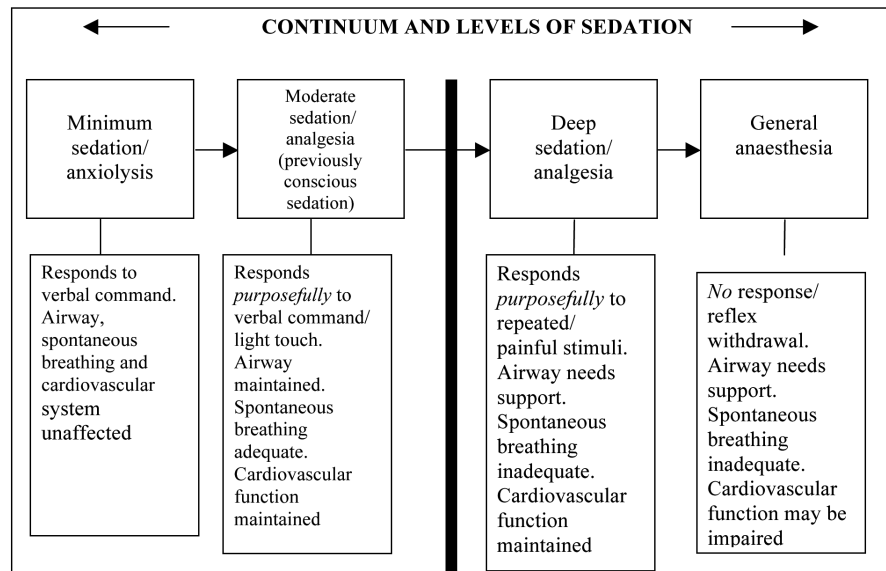


Fig. 1. The continuum and levels of sedation. From: American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice Guidelines for Sedation and Analgesia by Non-Anesthesiologists.²

- Is it possible to control the pain with local or regional analgesia?
- If systemic analgesia is indicated, which drugs will be needed?
- Does the patient's physical status allow the use of these systemic drugs?
- Which body part will be operated on?
 - Will the procedure interfere with the airway?
 - What position will the patient assume during the procedure?
 - Will the patient be able to tolerate this position?
 - Will the position interfere with respiratory or cardiovascular functions?
- Duration:
 - What is the expected duration of the procedure?
 - Will the patient be able to tolerate it?
 - Is there a chance that the patient may become hypothermic?
- Immobility:
 - Is immobility essential?
 - Will the patient co-operate to achieve immobility?
 - If not, how will immobility be achieved?

The sedation

When one considers the differences between sedation and general anaesthesia (Table 1), it is clear why in untrained and

inexperienced hands the sedation process may go awry sometimes.

Patients may unintentionally drift into deeper levels of sedation than intended, ending up under general anaesthesia. Deeper levels of sedation affect patient safety. Sedation end-points have therefore been described as a guide to the level of sedation targeted (Fig 1).

Unfortunately there is no accurate observational method to determine the level of sedation. Unlike anaesthesia providers, who know where to stop (loss of eyelid reflex), sedation providers must rely on sedation scales³⁻⁵ to try to quantify the level of sedation. These scales are all subjective and rely on stimulation of the patient to determine the level of sedation. In other words, the patient needs to be woken up to determine how deeply the patient is sleeping. Currently, the only secure way to know how deeply a patient is sedated is by distinguishing between consciousness and unconsciousness, i.e. keeping the patient awake rather than asleep. In general, once verbal contact with the patient is lost, the patient has moved from moderate sedation to deep sedation (Fig. 1) or from safe sedation to sedation that may be detrimental to the patient's safety. It can therefore be said

Safe sedation

Table 1. Differences between general anaesthesia and sedation

General anaesthesia	Sedation
Specific end-point: loss of consciousness	Vague end-point: how deep do you go?
Intentional loss of consciousness	Consciousness should be maintained – but may be lost
Intentional loss of protective reflexes	Protective reflexes should remain intact
Airway management planned	Patient must maintain and protect airway
No reaction to painful stimulus	May react to painful stimulus
No movement allowed	Movement may/may not be acceptable depending on procedure
Anaesthesiologist is in control	Patient must maintain airway, adequate breathing and stable cardiovascular status

Table 2. Simple versus advanced sedation techniques

Simple (basic) sedation techniques	Advanced sedation techniques
Induced by single agent	Induced by a combination of drugs by any route
Oral, transmucosal or rectal drugs, e.g. benzodiazepines OR	Any intravenous sedation, except as specified under simple sedation
Inhalation of nitrous oxide (N ₂ O) in oxygen in a 1:1 ratio OR	Any inhalational sedation except as specified under simple sedation
Intravenous midazolam, titrated to a maximum of 0.1 mg/kg	Infusion techniques, e.g. target-controlled infusions

that if anaesthesia is about putting people to sleep, sedation is about keeping patients awake.

Sedation providers must update their emergency and resuscitation skills and protocols regularly.

Most drugs used in sedation (benzodiazepines, propofol, opiates, etomidate and barbiturates) cause progressively deeper levels of sedation, and even anaesthesia, as doses accumulate. Titration of these drugs to the desired level of sedation is of utmost importance. Ketamine, however, causes dissociative sedation, a trance-like state that does not fit the sedation continuum. If used at doses recommended for sedation and analgesia, ketamine should not lead to loss of consciousness.

It is recommended that an operator-sedationist only target minimum sedation/anxiolysis (Fig. 1) by using simple sedation techniques (Table 2).¹ The patient will respond to verbal commands while

the airway, spontaneous breathing and cardiovascular function will remain unaffected. This level of sedation is inadequate for most painful procedures without the use of local analgesia.

When the operator is also performing the sedation, an additional trained person should be dedicated to monitoring the patient and ensuring that the sedation does not progress beyond minimal sedation.¹

This person should be able to assist the operator in case of an emergency. If the patient enters a deeper level of sedation than minimal sedation/anxiolysis, sedation guidelines recommend that a medically trained person other than the operator provide the sedation and monitoring while the operator completes the procedure.

Advanced sedation techniques require a dedicated sedation provider to perform the sedation and monitor the patient.

Considerations include:

- Is sedation the best option for this patient undergoing this procedure in this location? Should you reconsider?
- Will the planned sedation meet the requirements of the procedure?

Choice of drugs:

- Which drugs should be used to meet the requirements for the procedure?
- What is the purpose of each drug used – anxiolysis, amnesia, sedation or pain control?
- What will the effect of the drugs be on the airway, spontaneous breathing and cardiovascular system?

The patient

As more procedures are performed OOR, the operator has retained the opportunity to evaluate patients pre-operatively. However, the sedation provider usually does not have access to the patient until the day of the procedure. Patients are often selected for sedation by the nature and extent of the procedure, rather than their physical status. The sedation provider may therefore end up with a patient for a minimally invasive procedure, but with complex underlying medical conditions. A medical questionnaire filled out by the patient and sent to the sedation provider well in advance of the procedure date is an excellent way to identify medical problems that need attention. These patients may then be seen before the day of the procedure. The goal is to identify patients who might benefit from

performing the procedure in a different location.

A goal-directed medical examination should be performed before the start of the sedation. A crucial part is examination of the airway. Sedation providers must be trained to recognise possible airway problems and if indicated refer patients for general anaesthesia rather than sedation. Although a useful tool for grading patient physical status before sedation, the American Society of Anesthesiologists (ASA) physical status classification system (Table 3) has limitations. It does not include the age of the patient, and factors such as obesity and the nature and duration of the procedure are not taken into account.

The nature of the procedure will largely determine what the sedation will entail.

Patients should be advised about the standard anaesthetic fasting guidelines when advanced sedation techniques are used.

The details of patient selection are beyond the scope of this article. Ten conditions are highlighted that should at least make the sedation provider pause and think whether the patient is suitable for sedation OOR.

Ten considerations:

1. Airway: is there a possible airway problem or underlying respiratory disease?
2. Does the patient suffer from obstructive sleep apnoea?
3. Does the patient suffer from ischaemic heart disease?
4. Is there underlying valvular heart disease?
5. Does the patient suffer from uncontrolled hypertension?
6. Does the patient suffer from morbid obesity?
7. Is the patient elderly?
8. Is the patient pregnant?

Table 3. ASA physical status classification system

Class I	Normally healthy patient
Class II	Patient with mild systemic disease with no functional incapacity
Class III	Patient with severe systemic disease that limits activity, but not incapacitating
Class IV	Patient with severe systemic disease that is a constant threat to life
Class V	Moribund patient not expected to survive for 24 hours with or without surgery
E	Emergency procedure denoted by the letter E preceding the class number

9. Does the patient use drugs, herbs or supplements that may interfere with the drugs used in sedation?
10. If the patient is a child, is the sedation provider trained in sedation for children? Is the sedation provider confident in managing a child's airway? Does the sedation provider have an APLS (advanced paediatric life support) qualification?

Aftercare

Patients who have been sedated often do not receive the same standard of aftercare and recovery as patients after general anaesthesia. This may be because of limited budgets, limited room and limited availability of personnel. However, according to the sedation guidelines,¹ patients who receive deep sedation deserve the same standard of care as patients who receive a general anaesthetic.

Considerations include:

- Where will the patient recover?
 - Is there enough room for more than one patient to recover if necessary?
 - How will the patient be monitored? (What is the minimum required?)
 - Is there a trained person to monitor the patient?
 - Are there discharge criteria in place?
- Patient safety:
 - Is there a chance of delayed recovery as a result of long-acting drugs lingering in the body?
 - Where does the patient go from here?
 - Will the patient be accompanied by an adult?
 - Will there be competent care at home?
 - If transfer to an overnight facility is necessary, where will the patient go

and how will the patient get there?

- Did the patient receive written post-procedure instructions?
- Did the patient receive contact numbers in case of an emergency?

Conclusion

Sedation offers many benefits for patients undergoing minimally invasive procedures. In the hands of trained and caring sedation providers sedation can be a safe and positive experience for many patients.

References and further reading available at www.cmej.co.za.

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- Absence of any of the pieces of the sedation puzzle may be detrimental to patient safety.
- Important aspects of safe sedation are the location, the sedation provider, the operator, the procedure, the sedation, the patient and aftercare.
- Sedation providers need training in safe sedation practice.
- Modern drugs used in sedation are potent, rapid-acting and have a predictable offset.
- The operator must be aware of the limitations of sedation and respect these.
- The sedation must be planned to suit the requirements of the procedure.
- When the operator is also performing the sedation, simple or basic sedation techniques should be used and the level of sedation kept at minimal sedation/anxiolysis.
- The operator-sedationist should be assisted by a trained person who should monitor the patient and assist in case of emergencies.
- When advanced techniques are used, a dedicated sedation provider should perform the sedation and monitor the patient.
- Patients under deep sedation should receive the same standard of care as patients under general anaesthesia.