after the administration of sedative and analgesic drugs. The nature of the procedure to be performed may also not be changed after sedative and/or analgesic drugs have been administered to the patient.

Patients/parents/caregivers must understand the risks of sedation before consenting. Therefore, an explanation of the procedure, the proposed sedation technique and the risks and benefits of the proposed technique should be given. Patients/parents/caregivers must be aware of the possibility that the sedation may fail and that the procedure may have to be abandoned or performed under GA at a later date.

Alternatives to sedation (e.g. GA or local/regional anaesthesia) should also be discussed. Behavioural management techniques as an alternative to sedation, if relevant, should be discussed to ensure that the most suitable form of treatment is selected.

Consent must be obtained for both the procedure and the sedation. It is the responsibility of the SP to ensure that the patient/parent/caregiver understands the consequences of the decisions they are about to make. If the child is not legally competent to give consent (e.g. underage or a child with special needs), it will have to be obtained from someone with parental responsibility (i.e. the mother or father, or legal caregiver).

A more difficult question to answer is *when* can a child give consent for a procedure. According to the Medical Protection Society (MPS), a child of 12 years or older may consent to medical treatment. For surgical treatment, a child of 12 years or older may consent with a parent or guardian's assent. The child must, however, have the maturity to understand the implications of the procedure.

As cited in the *Southern African Journal of Anaesthesia and Analgesia,*[7] children can give consent in the following situations: (i) for medical treatment, if they are older than 12 years of age, and if they have the maturity and capacity "to understand the benefits, risks, social and other implications of the treatment" – this is independent of parents' consent; or (ii) for surgical procedures, if they are 12 years of age and assisted by their parent or legal guardian (Form 34, or Form 35 if the child's parents themselves are aged 18 years and younger).

The planned usage of suppositories or rectal medication must also be explained carefully to the parents and consent be obtained ahead of time.

## 5. Patient assessment

Appropriate selection of children for sedation is the first step to safe sedation practice. It is generally accepted that adults, through their lived experience, have the necessary coping skills to ensure safe and successful sedation. However, children of different age groups, and even children within the same age group, have different coping skills. The procedure to be

performed will largely determine what level of coping skills is required of the child. Every child must therefore specifically be assessed to determine their suitability for sedation outside of a hospital operating room.

Unfortunately, most SPs only meet the child on the day of the procedure. The operator has the privilege of evaluating the child during the first consultation. Therefore, the SP should assist and guide the operator in evaluating the child's suitability specifically for sedation. It may be helpful to provide some guidance in the form of printed or written notes to assist the operator in this process. Inappropriate patient selection is a recurring factor in sedation-related adverse events and poor outcomes.

It is recommended that, if at all possible, the SP should meet the child some time before the sedation to determine the child's cooperation capabilities and build rapport with the child. The presedation visit should also be used to obtain information concerning the child, as well as providing information to the parent/caregiver. It is recommended that the information should be in the form of written notes for the parent/caregiver to refer back to as necessary.

If it is not practical to meet the child in person, it is advised that the parent/caregiver is contacted in advance of the sedation appointment to obtain and share information as set out above. The information should prepare the parent/caregiver and child for what to expect during the sedation, thereby facilitating communication and alleviating anxiety. This may be followed up with a phone call to the parent/caregiver to address any questions directly.

Whenever possible, previous records (i.e. medical, sedation, anaesthesia and surgical history) should be retrieved and examined.

The presence or absence of the parent/caregiver during the procedure needs to be discussed as well.

The evaluation of the child should include the following:

- A recent medical history questionnaire (Appendix 4). Details of previous sedations are vital, as previous failed attempts at sedation may indicate the need for GA for future procedures. Enquire about previous problems with airway management as part of the suitability check for out-of-hospital procedures.
- The drug history of the child, with special attention to:
  - chronic medication (e.g. asthmatic treatment, steroids and antihistamines for allergies, isotretinoin (Roaccutane), anti-diabetic drugs),
  - psychotropic drugs (e.g. anti-epileptics),
  - stimulants (e.g. methylphenidate), or
  - recreational drugs in teenagers, especially since the relaxation of legislation on the use of marijuana.

- An airway assessment – various airway evaluation scales are available to assist the SP with evaluating the airway, e.g. the Lemon Law[8] and Mallampati[9] classifications (Appendix 5). The Lemon Law aids the SP in identifying factors for a difficult airway.
  During an airway assessment:
  - Observe from the front and side looking for particularly syndromic features (e.g. low-positioned or abnormal ears and pre-auricular tags)
  - Hypoplastic or receding chin
  - Upper jaw overbite
  - Loose teeth
  - Enlarged tongue
  - Enlarged tonsils (approaching the midline or associated with snoring)
  - Flexion and extension of the neck
  - Hoarseness
  - Wheezing

An active upper respiratory tract infection (URTI) is a current or recent URTI, where two or more of the following symptoms or signs are still present:

- rhinorrhoea
- sore or scratchy throat
- sneezing
- nasal congestion
- malaise
- cough
- fever
- unexplained tachycardia
- a parent reports or is concerned that the child is sick

Airways remain reactive for up to six weeks following a URTI and reactive airways are prone to laryngospasm during PSA. Sedation is probably best avoided during this period.

An assessment must also include:

- an evaluation of the cardiovascular and respiratory systems by way of auscultation of the heart and lungs, and
- an enquiry about previous abnormal laboratory tests.

Where indicated, a paediatrician should be consulted about the condition of the child. If the child was seen at an earlier appointment, a re-evaluation of the health status immediately before sedation and surgery is recommended.

Assessment should be done in accordance with the *ASA physical status classification system*[10,11](Table II). However, while anaesthesia and sedation providers use the ASA classification to indicate a child's overall preoperative status for anaesthesia and sedation, it may be misinterpreted as a classification to predict risk. It is important to realise that this is *not* a risk classification, but an evaluation of clinical status only.

**Table II: American Society of Anesthesiologists physical status classification system modified[10,11]**

| | |
|---|---|
| **Class I** | A normal healthy patient, no functional limitations |
| **Class II** | A patient with a history of well-controlled mild systemic disease (e.g. diabetes mellitus, hypertension), no substantial functional limitations |
| **Fragile ASA II patient** | A patient not controlled on morning or afternoon of procedure (i.e. hypertensive, diabetic, asthmatic, obstructive sleep apnoea) |
| **Class III** | A patient with severe systemic disease that limits activity, but is not incapacitating |
| **Class IV** | A patient with severe systemic disease that is a constant threat to life |
| **Class V** | A moribund patient not expected to survive 24 hours with or without an operation |
| **Class VI** | Clinically deceased patients |
| **"E"** | An emergency procedure is denoted by the letter E following the class number |

ASA-E – Emergency operation for any of the above classes (e.g. ASA II-E)

Only children in ASA Class I, II and fragile ASA II well-controlled, should be considered for sedation outside of a hospital operating theatre. It is possible for the ASA status to deteriorate from the time the child was initially evaluated to the time of the sedation (e.g. ASA II patients may become ASA III patients by the time of the procedure). Therefore, the recommendation is that children should be evaluated again immediately prior to the procedure.

Children in ASA Class III, IV or V require higher levels of monitoring and care. It is advised that procedures for these patients be done in-hospital.

Certain children are at increased risk for complications and it is imperative that these patients be recognised as such, during the preoperative assessment either in person, through the medical questionnaire or by telephonic consultation. Strong consideration should be given to sedating these children in a **hospital setting and should be determined on an individual basis**. Other factors may play a role (e.g. the extent and duration of the procedure, manner of transport and level of care at home).

Children at an increased risk for complications include, but is not limited to:

- Children younger than 3 years of age.
- Children with a history of prematurity with residual pulmonary, cardiovascular, gastrointestinal or neurological problems, or significant anaemia.
- Children with congenital syndromes.
- Children with obesity (> 95$^{th}$ percentile body mass index (BMI) for their age).
  **The association between obesity and obstructive sleep apnoea (OSA) limits the use of sedatives and opioids and increases risk in light of early discharge requirements. Children with restrictive lung disease are prone to desaturation – they must be evaluated on a case-by-case basis.*
- Children with previous failed sedation.
- Children with any known adverse reactions (hyperactive or paradoxical response) or allergy to any of the sedation drugs.
- Children who display severe behavioural problems or hyperactivity, or who are mentally challenged.
- Children whose parents are reluctant.

## 6. Guidelines for fasting

Preoperative fasting for sedation is controversial. Some authorities, especially in dentistry and emergency medicine, consider it to be unnecessary. Airway reflexes are assumed to be maintained during minimal and moderate sedation, but may be lost during deep sedation. If basic or standard sedation techniques (Section 2.5.1) are planned, fasting is recommended, but not mandatory. If advanced techniques (Section 2.5.2), including dissociative and non-dissociative techniques, or deep sedation are planned, the following standard anaesthetic fasting guidelines are recommended:

- Clear fluids, apple juice: two hours. Some clinicians allow clear fluids even one hour before the procedure. A "clear fluid" is defined as fluid without particles.
- Breast milk: four hours.
- Formula feeds and solid food: six hours.

For a procedure to be completed safely, children often need deep sedation for which advanced sedation techniques may be required. When a basic or standard sedation technique is used in non-fasted children and fail, the technique should not be advanced. Rather, the procedure must be abandoned and rescheduled for a later time. In urgent cases, when a procedure cannot be postponed and simple sedation techniques are deemed unsuitable, a GA with rapid sequence induction should be considered.

Children should not have to fast for prolonged periods. Clear fluids should be administered up to two hours before the procedure. This may need some fine planning and good communication with parents/caregivers.