Guidelines on Sedation for Dental Procedures in Paediatric Patients

2009

Prior to the start of any sedative procedure. In healthy or medically stable individuals (ASA I), patients with significant medical considerations (ASA III, IV) may require consultation with the patient, parent, guardian or care giver must be advised regarding the procedure associated with determination of adequate oxygen supply and equipment necessary for obtaining the patient’s behavior prohibits such determination. A focused physical examination must be carried out. Pre-operative verbal consent of the additional person experienced in the treatment of the patient being treated must be immediately available. Either (1) a functioning defibrillator, an appropriately trained individual, or (2) appropriate scavenging system for suction, an appropriately trained individual, must be available to immediately manage discharge to the patient in the event of cardiac arrest. The appropriate monitoring of heart rate, blood pressure, oxygen saturation, temperature, skin or body temperature continually. In the event of the highest excursion, the pre-operative care of appropriately trained, including physiological parameters of the patient. Monitor the patient’s level of consciousness, ventilation, respiration rate, oxygen saturation, parent, escort, guardian or care giver. 6. Emergency medical team should be available prior to the intended intended. 7. Consent for the sedative procedure must be obtained. Baseline physiological parameters must be obtained based on the sedative technique. Preoperative preparations must be carried out prior to the patient’s behavior prohibits such determination. Personnel: Support personnel to monitor appropriate physiological parameters and to assist.
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Infants and young children with severe oral diseases (including Nursing caries and traumatic injuries to the teeth and oral-facial tissues) present difficult dental care problems for the child, the parent and dentists alike. In addition, persons with severe physical handicaps, mental disabilities and anxieties issues are often referred to specialist paediatric dentists for management and treatment.

In the management of patients who are genuinely fearful of dental procedures but are willing to try to cooperate, the use of nitrous oxide sedation, can be used to allay their fears and alter their mood so that the dental procedures may be carried out. In the most severe cases, dental treatment can only be carried out under general anaesthesia which should normally be best done in the Hospital Operating Theatre. On the other hand, the majority of otherwise relatively healthy children and minimally disabled patients can now be treated by specialist paediatric dentists in a properly equipped dental office under deep sedation delivered by a competent and preferably board certified anaesthesiologist.

The use of deep sedation in the medical and dental offices is increasingly popular. Guidelines on office based sedation have been developed by various professional bodies. For example, the first guidelines were developed by the American Academy of Pediatric Dentistry in 1989 and which have been revised in subsequent years including 1991, 1996, 2000, 2006, 2008 and 2009.

In Hong Kong, the use of deep sedation in the dental office using nitrous oxide/sevofluorane induction followed by the IV infusion of propofol has been increasing accepted by paediatric dentists, anaesthesiologists and patients alike. However, there are no clear and written documented and accepted Guidelines.

Members of the Executive Committee of the Hong Kong Society of
Paediatric Dentistry (HKPD) have felt the strong need for sedation guidelines to be developed and disseminated to the dental profession in Hong Kong. A special Working Group, under the leadership of Dr. Eilly Lau was formed and comprised Drs. Adam H.O. Au, Kenneth K. K. Hui, Lily S.M. Tong and Cynthia K.Y. Yiu, all of whom are specialists in Paediatric Dentistry. They have also recruited Dr. John M. Low, specialist in Anaesthesiology, as their Advisor and have produced a manuscript which is comprehensive and covers all aspects of minimal, moderate and deep sedation as well as general anaesthesia. The manual covered the education requirements of the dentists, the list of essential and desirable equipment, and drugs necessary for such in-office sedation. In the extensive list of appendices, the information included excellent sample forms on sedation records, written patient instructions, pre and post-operative measures and other valuable information that other dentists can modify and adopt for their own immediate use. A reading list of the most relevant publications has been included for those who wish to pursue the information further in detail.

This manual is so helpful and timely that the Executive Committee of the HKSPD has decided that it should be widely disseminated. First, it will be posted on the website of the HKSPD at www.hkspd.org. We also plan to have it published and distributed to all registered dentists and members of the Hong Kong Dental Association.

Professor Stephen H.Y. Wei
DDS, MS, MDS
FRACDS, FDSRCS (England), FACD, FICD
FCDSHK (Paediatric Dentistry), FHKAM,
Diplomate, American Board of Pediatric Dentistry
President & Founder of HKSPD
Sedation is required for some paediatric patients to overcome dental fear and anxiety to receive dental treatment. Sedation for dental procedures includes the administration of any drugs by any route or techniques which cause depression of the central nervous system.

In view of the expanding demand for use of sedative agents and the importance of delivering good quality pain-free treatment to children, guidelines for the practice of sedation are important. The Hong Kong Society of Paediatric Dentistry has set up these guidelines to assist dentists in the delivery of safe and effective sedation to facilitate dental treatment.
**PRINCIPLES OF SEDATION**

*Guidelines on Sedation for Dental Procedures in Paediatric Patients*

1. **Make it official**
The current practice of dental sedation in Hong Kong is essentially unregulated, unlegislated and non-standardized. These guidelines aim at laying down practical and definable standards of dental sedation to ensure quality care and predictable outcome.

2. **Make it safe**
The safety of the patient is the foremost obligation of the sedationist in any setting. Patients need to know that a single safety standard applies regardless of whether sedation is delivered in a dental office or hospital.

Dentists/sedationist should be aware that sedation represents a continuum. Thus, a patient may move easily from a light level of sedation to a deeper level, which may result in the loss of patient’s protective reflexes. Hence, sedationist intending to produce a given level of sedation should be able to diagnose and manage the physiological consequences (rescue) for patients whose level of sedation becomes deeper than initially intended.

3. **Make it practical**
The inducement for performing dental procedures under sedation in the dental office includes the cost-saving potential (compared with general anaesthesia in the hospital), better control of schedule and also patient convenience. Office-based sedation has been facilitated by the introduction of short-acting anaesthetic drugs that are associated with minimum side effects and which usually permit a rapid awakening and recovery.

4. **Make it pleasant**
The need for establishing a good dental practice with sedation is to make the entire treatment experience a pleasant one. By contrast with many hospital experiences, a good office sedation practice is
relaxing, comfortable and convenient for all involved. The child will cope better with treatment due to reduction of fear and perception of pain and future development of dental fear and anxiety can be prevented. For the dentist, sedation can facilitate accomplishment of dental procedures and reduce stress and unpleasant emotions. Much time is saved as the number of dental visits can be reduced.
GENERAL GUIDELINES

Guidelines on Sedation for Dental Procedures in Paediatric Patients

1. The patient should be assessed before and after the procedure and this assessment should include:

1.1 A concise medical history, examination, performance of appropriate investigations and identification of risk factors (Appendix A). The American Society of Anesthesiologists classification system is convenient for this purpose (Appendix B).

1.2 Informed consent for sedation and the treatment procedure (Appendix C).

1.3 Instructions for preparation for the procedure including the importance of fasting (Appendix D).

1.4 Guidelines for monitoring the recovery period and discharge of the patient (Appendix E), and post-operative patient evaluation (Appendix F).

2. If the patient has any serious medical condition, then the appropriate treating general medical practitioner and/or their specialist should be consulted prior to any planned treatment under sedation. If the patient is deemed to be seriously medically compromised, then an anaesthesiologist should be present to administer sedation and to monitor the patient during the procedure.

3. The practitioner administering sedation requires sufficient knowledge to be able to:

3.1 Understand the actions of the drug or drugs being administered.

3.2 Detect and manage appropriately any complications arising from these actions. In particular medical and dental practitioners administering sedation must be skilled in airway management and
cardiovascular resuscitation

3.3 Anticipate and manage appropriately the modification of sedative drug actions by any concurrent therapeutic regimen or disease process which may be present

3.4 Techniques intended to produce loss of consciousness must not be used unless an anaesthetist is present

3.5 A written record of the dosages of drugs and the timing of their administration must be kept as a part of the patient’s records. Such entries should be made as near the time of administration of the drugs as possible. This record should also note the regular readings from the monitored variables (Appendix G).

3.6 Techniques which compensate for inadequate local analgesia by means of heavy sedation must not be used unless an anaesthesiologist is present

3.7 Proper equipment and accessory apparatus must be available for different levels of sedation (Appendix H).

3.8 Emergency drugs should be available according to individual or procedural needs (Appendix I).
1. If an appropriately trained medical or dental practitioner is not present to administer sedation and monitor the patient, there should be an assistant present during the procedure, appropriately trained in observation and monitoring of sedated patients and in resuscitation whose sole duty shall be to monitor the level of consciousness and cardio-respiratory function of the patient.

2. If at any time spontaneous respiration and/or protective reflexes are lost, or the patient does not respond to verbal commands or stimulation, both the sedationist and assistant must devote their entire attention to monitoring and treating the patient until recovery, or until such time as another medical or dental practitioner becomes available to take responsibility for the patient’s care.

3. If general anesthesia or loss of consciousness is sought for the procedure, then an anaesthesiologist must be present to care exclusively for the patient.
**TERMINOLOGY**

**sedationist**- Anaesthesiologist with experience in office-based sedation techniques or dentist with training and experience in office-based sedation techniques

**must/shall**- indicates an imperative need and/or duty; an essential or indispensable item; mandatory

**should**- indicates the recommended manner to obtain the standard; highly desirable

**may**- indicates freedom or liberty to follow a reasonable alternative

**continual**- repeated regularly and frequently in a steady succession

**continuous**- prolonged without any interruption at any time

**time-oriented anaesthesia record**- documentation at appropriate time intervals of drugs, doses and physiologic data obtained during patient monitoring

**immediately available**- on site in the facility and available for immediate use
1. Definitions

1.1 Minimal sedation

A minimally depressed level of consciousness, produced by a pharmacological method that retains the patient’s ability to independently and continuously maintain an airway and respond normally to tactile stimulation and verbal command. Although cognitive function and coordination may be modestly impaired, ventilatory and cardiovascular functions are unaffected.

1.2 Moderate sedation

A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No intervention is required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

1.3 Deep sedation

A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully after repeated verbal or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

1.4 General anaesthesia

A drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require...
assistance in maintaining a patent airway, and positive-pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

2. Specific guidelines for intended level of sedation

2.1 Educational requirements

A. For minimal and moderate sedation

1. To administer minimal and moderate sedation, the dentist must have successfully completed:
   • supervised training in dental sedation.
   • a course in Basic Life Support or adequate experience in Basic Life Support.

2. Dental auxiliary personnel assisting during minimal and moderate sedation should have completed a course in Basic Life Support or adequate experience in Basic Life Support.

B. For deep sedation or general anaesthesia

1. To administer deep sedation or general anaesthesia, the dentist must have completed:
   • supervised training in dental sedation.
   • a course in Basic Life Support or adequate experience in Basic Life Support.

2. An independent anaesthetist trained in providing deep sedation or general anaesthesia to patient must be present during sedation.

3. Administration of deep sedation or general anaesthesia by the
anaesthesiologist requires the anaesthesiologist to have completed a course or adequate experience in Basic Life Support and Advanced Cardiac Life Support.

4. Dental auxiliary personnel assisting during deep sedation or general anaesthesia should have completed a course in Basic Life Support or adequate experience in Basic Life Support.
A. Minimal sedation

1. Patient evaluation

- Patients considered for minimal sedation must be suitably evaluated prior to the start of any sedative procedure.
- In healthy or medically stable individuals (ASA I, II), this may consist of a review of their current medical history and medication use.
- However, patients with significant medical considerations (ASA III, IV) may require consultation with their primary care physician or consulting medical specialist.

2. Pre-operative preparation

- The patient, parent, guardian or care giver must be advised regarding the procedure associated with the delivery of any sedative agents and informed consent for the proposed sedation must be obtained.
- Determination of adequate oxygen supply and equipment necessary to deliver oxygen under positive pressure must be completed.
- Baseline vital signs must be obtained unless the patient’s behavior prohibits such determination.
- A focused physical evaluation must be performed as deemed appropriate.
- Pre-operative dietary restrictions must be considered based on the sedative technique prescribed.
- Pre-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.

3. Personnel and equipment requirements

Personnel:
- At least one additional person experienced in Basic Life Support
must be present in addition to the dentist.

Equipment:
• A positive-pressure oxygen delivery system suitable for the patient being treated must be immediately available.
• When inhalation equipment is used, it must have a fail-safe system that is appropriately checked and calibrated.
• The equipment must also have either (1) a functioning device that prohibits the delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen analyzer with audible alarm.
• An appropriate scavenging system may be available if gases other than oxygen or air are used.

4. Monitoring and documentation

Monitoring:
A dentist, or at the dentist’s direction, an appropriately trained individual, must remain in the operatory room during active dental treatment to monitor the patient continuously until the patient meets the criteria for discharge to the recovery area. The appropriately trained individual must be familiar with monitoring techniques and equipment.

Monitoring must include:

• Oxygenation:
  – Color of mucosa, skin or blood must be evaluated continually.
  – Oxygen saturation by pulse oximetry may be clinically useful and should be monitored.

• Ventilation:
  – The dentist and/or appropriately trained individual must observe chest excursions continually.
– The dentist and/or appropriately trained individual must verify respirations continually.

• Circulation:
  – Blood pressure and heart rate should be evaluated pre-operatively, post-operatively and intra-operatively as necessary (unless the patient is unable to tolerate such monitoring).

Documentation:
An appropriate sedative record must be maintained, including the names, routes, sites of all drugs administered, including local anaesthetics, time of administration, dosages, and monitored physiological parameters.

5. Recovery and discharge

• Oxygen and suction equipment must be immediately available if a separate recovery area is utilized.
• The qualified dentist or appropriately trained clinical staff must monitor the patient during recovery until the patient is ready for discharge by the dentist.
• The qualified dentist must determine and document that level of consciousness, oxygenation, ventilation and circulation are satisfactory prior to discharge.
• Post-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.

6. Emergency management

If a patient enters a deeper level of sedation than the dentist is qualified to provide, the dentist must stop the dental procedure until the patient returns to the intended level of sedation.
B. Moderate sedation

1. Patient evaluation

- Patients considered for moderate sedation must be suitably evaluated prior to the start of any sedative procedure.
- In healthy or medically stable individuals (ASA I, II), this may consist of a review of their current medical history and medication use.
- However, patients with significant medical considerations (ASA III, IV) may require consultation with their primary care physician or consulting medical specialist.

2. Pre-operative preparation

- The patient, parent, guardian or care giver must be advised regarding the procedure associated with the delivery of any sedative agents and informed consent for the proposed sedation must be obtained.
- Determination of adequate oxygen supply and equipment necessary to deliver oxygen under positive pressure must be completed.
- Baseline vital signs must be obtained unless the patient’s behavior prohibits such determination.
- A focused physical evaluation must be performed as deemed appropriate.
- Pre-operative dietary restrictions must be considered based on the sedative technique prescribed.
- Pre-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.

3. Personnel and equipment requirements

Personnel:
- At least one additional person trained in Basic Life Support must be
present in addition to the dentist.
• Support person is to monitor appropriate physiological parameters and to assist in any supportive or resuscitation measures, if required.

**Equipment:**
• A positive-pressure oxygen delivery system suitable for the patient being treated must be immediately available.
• When inhalation equipment is used, it must have a fail-safe system that is appropriately checked and calibrated.
• The equipment must also have either (1) a functioning device that prohibits the delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen analyzer with audible alarm.
• An appropriate scavenging system may be available if gases other than oxygen or air are used.
• The equipment necessary to establish intravenous access must be available.

### 4. Monitoring and documentation

**Monitoring:**
A qualified dentist administering moderate sedation must remain in the operatory room to monitor the patient continuously until the patient meets the criteria for recovery. When active treatment concludes and the patient recovers to a minimally sedated level, a qualified auxiliary may be directed by the dentist to remain with the patient and continue to monitor them as explained in the guidelines until they are discharged from the facility. The dentist must not leave the facility until the patient meets the criteria for discharge and is discharged from the facility. Monitoring must include:

• Consciousness:
  – Level of consciousness (e.g., responsiveness to verbal command) must be continually assessed.
• Oxygenation:
  – Color of mucosa, skin or blood must be evaluated continually.
  – Oxygen saturation by pulse oximetry may be clinically useful and should be considered.

• Ventilation:
  – The dentist must observe chest excursions continually.
  – The dentist must monitor ventilation. This can be accomplished by auscultation of breath sounds, monitoring end-tidal CO₂ or by verbal communication with the patient.

• Circulation:
  – The dentist must continually evaluate blood pressure and heart rate (unless the patient is unable to tolerate and this is noted in the time-oriented anaesthesia record).
  – Continuous ECG monitoring of patients with significant cardiovascular disease should be considered.

**Documentation:**
– Appropriate time-oriented anaesthetic record must be maintained, including the names, routes and sites of all drugs administered, including local anaesthetics, time of administration, dosages and monitored physiological parameters.
– Pulse oximetry, heart rate, respiratory rate and blood pressure must be recorded continually.

**5. Recovery and discharge**

• Oxygen and suction equipment must be immediately available if a separate recovery area is utilized.
• The qualified dentist or appropriately trained clinical staff must monitor the patient during recovery until the patient is ready for discharge by the dentist.
• The qualified dentist must determine and document that level of consciousness, oxygenation, ventilation and circulation are satisfactory prior to discharge.
• Post-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.
• If a reversal agent is administered before discharge criteria have been met, the patient must be monitored until recovery is assured.

6. Emergency management

• If a patient enters a deeper level of sedation than the dentist is qualified to provide, the dentist must stop the dental procedure until the patient returns to the intended level of sedation.
• The qualified dentist is responsible for the sedative management, adequacy of the facility and staff, diagnosis and treatment of emergencies related to the administration of moderate sedation and providing the equipment, drugs and protocol for patient rescue.

C. Deep sedation or general anaesthesia

1. Patient evaluation

• Patients considered for deep sedation or general anaesthesia must be suitably evaluated prior to the start of any sedative procedure.
• In healthy or medically stable individuals (ASA I, II), this may consist of a review of their current medical history and medication use.
• However, patients with significant medical considerations (ASA III, IV) may require consultation with their primary care physician or consulting medical specialist.

2. Pre-operative preparation

• The patient, parent, guardian or care giver must be advised
regarding the procedure associated with the delivery of any sedative agents and informed consent for the proposed sedation must be obtained.

- Determination of adequate oxygen supply and equipment necessary to deliver oxygen under positive pressure must be completed.
- Baseline vital signs must be obtained unless the patient’s behavior prohibits such determination.
- A focused physical evaluation must be performed as deemed appropriate.
- Pre-operative dietary restrictions must be considered based on the sedative technique prescribed.
- Pre-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.
- An intravenous line, which is secured throughout the procedure, must be established.

3. Personnel and equipment requirements

**Personnel:** A minimum of three (3) individuals must be present.
- An anaesthetist or sedationist qualified in accordance with Part B of these guidelines to administer the deep sedation or general anaesthesia.
- Two additional individuals who have current anaesthesia of successfully completing a Basic Life Support course.
- When the same individual administering the deep sedation or general anaesthesia is performing the dental procedure, one of the additional appropriately trained team members must be designated for patient monitoring.

**Equipment:**
- A positive-pressure oxygen delivery system suitable for the patient being treated must be immediately available.
- When inhalation equipment is used, it must have a fail-safe system
that is appropriately checked and calibrated. The equipment must also have either (1) a functioning device that prohibits the delivery of less than 30% oxygen or (2) an appropriately calibrated and functioning in-line oxygen analyzer with audible alarm.

- An appropriate scavenging system may be available if gases other than oxygen or air are used.
- The equipment necessary to establish intravenous access must be available.
- Equipment and drugs necessary to provide intensive airway management, and advanced cardiac life support must be immediately available.
- Resuscitation medications must be immediately available.

4. Monitoring and documentation

*Monitoring:*
A qualified dentist administering deep sedation or general anaesthesia must remain in the operatory room to monitor the patient continuously until the patient meets the criteria for recovery. The dentist must not leave the facility until the patient meets the criteria for discharge and is discharged from the facility. Monitoring must include:

- **Oxygenation:**
  - Color of mucosa, skin or blood must be evaluated continually
  - Oxygen saturation by pulse oximetry may be clinically useful and should be considered

- **Ventilation:**
  - The dentist must observe chest excursions continually.
  - The dentist must monitor ventilation. This can be accomplished by auscultation of breath sounds, monitoring end-tidal CO₂ or by verbal communication with the patient
• Circulation:
  – The dentist must continually evaluate blood pressure and heart rate (unless the patient is unable to tolerate and this is noted in the time-oriented anaesthesia record).
  – Continuous ECG monitoring of patients with significant cardiovascular disease should be considered.

• Temperature:
  – A device capable of measuring body temperature should be readily available during the administration of deep sedation or general anaesthesia.
  – The equipment to continuously monitor body temperature should be available and temperature monitoring should be performed whenever triggering agents associated with malignant hyperthermia are administered.

**Documentation:**
  – Appropriate time-oriented anaesthetic record must be maintained, including the names, routes, sites of all drugs administered, including local anaesthetics, dosages, time of administration and monitored physiological parameters.
  – Pulse oximetry, heart rate, respiratory rate and blood pressure must be recorded at least every 5 minutes continually.

5. **Recovery and discharge**

• Oxygen and suction equipment must be immediately available if a separate recovery area is utilized.
• The dentist or clinical staff must continually monitor the patient’s blood pressure, heart rate, oxygenation and level of consciousness.
• The dentist must determine and document that level of consciousness, oxygenation, ventilation and circulation are satisfactory prior to discharge.
• Post-operative verbal and written instructions must be given to the patient, parent, escort, guardian or care giver.

6. Emergency management

• The qualified dentist is responsible for the sedative/anaesthetic management, adequacy of the facility and staff, diagnosis and treatment of emergencies related to the administration of deep sedation or general anaesthesia and providing the equipment, drugs and protocol for patient rescue.
1. Inhalation (N₂O / O₂ Sedation) / Relative Analgesia (RA) Sedation

- Most frequently used sedative agent
- Gas mixture shall contain a maximum of 50% nitrous oxide
- Reliable in terms of onset and recovery as long as the patient accepts the nasal hood and breathes through the nose
- Minimal effect on cardiovascular and respiratory function, as well as on laryngeal reflex

**Indications:**
- For children age 4 or older
- For patients with a strong gagging reflex, with muscular tone disorders such as cerebral palsy

**Contra-indications:**
- Pre-co-operative children
- Patients with upper airway problems as common cold, tonsillitis or nasal blockage
- Patients on bleomycin chemotherapy
- Psychotic patients
- Patients with porphyria

**Dosage:**
Initiated by giving 2-5 minutes of pure oxygen, followed by increase of nitrous oxide every second minute. The maximum recommended concentration of nitrous oxide is 50%.

2. **Oral Sedation**

- By far the most universally accepted and easiest method of drug administration
- The effect is the most variable since the method is dependant on absorption through the gastrointestinal (GI) mucosa. It is important
to recognize that as anxiety increases, GI motility diminishes or even ceases. Heightened anxiety levels further deter gastric emptying and drug absorption

Factors that most influence paediatric agent and dosage selection:
1. Weight (and age) are the most objective indices correlated with dosing recommendations
2. Health status issues
3. Neuromuscular strength
4. Ability to maintain a patent airway
5. Detail of the patient’s relative emotionality (how the child perceives and is likely to react to noxious stimuli). Assessment of the patient should include: a) categorization of the level of apprehension/resistance to be overcome; b) the relative invasiveness of the procedure; and c) the duration of the procedure
6. Categorizing the patient’s degree of apprehension, visit length, and relative invasiveness of the task can serve to mediate upward or downward adjustments in dosage

The technique:
• Select the sedative agent(s)
• Calculate the proper dose for the child patient
• The arms, legs and mid-body should be secured, however, the chest and diaphragm should be freed and monitored carefully to ensure responsiveness
• Following the administration of oral (prescription) sedative drugs, the child may develop partial, or total obstruction of the upper airway and must be closely supervised by a responsible person

3. Intramuscular Sedation

• Pay attention to the anatomy of the injection sites, especially the avoidance of major nerves and blood vessels
• A prolonged time is still required to reach the effect
• Intra-muscular administration may be associated with delayed onset or recovery

4. Intravenous Sedation

In the hands of properly trained professionals, this method can be the easiest, most efficient, and safest next to sedation by inhalation.

Combination of the above methods and agents

Conscious sedation is usually most effective when combined with the use of local anaesthesia.

Inhalation sedation is the next most frequently combined technique. Nitrous oxide and oxygen can be combined with all other methods of conscious sedation.

The orally administered sedatives are the most commonly employed in combination. Most frequently combined agents with sedatives include hypnotics, narcotics, and/or antihistamines. The concept of balanced sedation suggests the need to consider combinations of agents to offset the limitations of single agents, such as, reduced nausea and emesis by the addition of an anti-emetic (hydroxyzine or promethazine) to sedative-hypnotics as well as improved sedation and need for lower sedative (primary agents) dosages. A great deal of care must be taken when combining oral agents to avoid deepening the patient’s state from conscious sedation to unconscious sedation or general anaesthesia.

The oral premedication of the patient with minor tranquilizers in advance of the use of inhalation or parenteral sedation methods is also a common practice.
I. Pre-operative Patient Evaluation Questionnaire
手術前健康狀況評估問卷

Name 姓名: ____________________________  Sex 性別: M / F
Phone no. 電話: ________________  Body Weight 體重: _______ (Kg)
Height 身高: ________________ (cm)  BP 血壓: ___________ (mmHg)
Pulse 脈搏: ________________ (bpm)  Patient. No: ________________

1. Any chronic disease or serious illness?  Yes / 有  No / 無
If yes, give details: ____________________________________________
有沒有患有任何長期或嚴重疾病？
如有的話，請列詳情: _______________________________________

2. Any operations or anaesthetics before?  □  □
When and what type? __________________________________________
有沒有接受過任何麻醉或手術？
如有的話，日期、麻醉及手術種類？ ___________________________

3. Has the patient or any relative had any difficulties or complications with anaesthetics or operations?
If so, give details: _____________________________________________
病人或近親曾否於手術或麻醉中出現問題？
如有的話，請列詳情: _________________________________________

4. Has the patient taken regular medicine or drugs during the past year (including Chinese or herbal medicine)?  □  □
If yes, give details: __________________________________________
過去一年曾否長期服食任何葯物(包括中藥及藥)？
如有的話，請列詳情: ________________________________________

5. Allergic to any drugs or medicine or food  □  □
Which ones? ________________________________________________
6. Any history of easy or excessive bleeding □ □
曾否出現止血或出血過多的問題？__________________________

7. For female patient: Is there a possibility the patient could be pregnant？
When is the patient’s LMP: ________________________________
如病人是女性，現正是否懷孕？
過去的一次月經的第一天是: ________________________________

Have you suffered from any of the following
閣下曾否患有下列疾病: (Yes / 有 □)
□ Congenital Heart Disease 先天性心臟病
□ Behavioural / Emotional illness 行為或情緒病
□ Asthma 喘喘
□ Tuberculosis 肺癆病
□ Epilepsy 癲癇或羊癇症
□ Diabetes 糖尿病
□ Hepatitis 肝炎
□ Intellectual / Physical Disabilities 智障或殘障
□ Infectious Disease 傳染病
□ Upper Respiratory Infection 發燒 / 咳嗽 / 有痰 / 流鼻水
ASA Physical Status Classification

**Class I**  A normally healthy patient

**Class II**  A patient with mild systemic disease (e.g. controlled reactive airway disease).

**Class III**  A patient with severe systemic disease (e.g. a child who is actively wheezing).

**Class IV**  A patient with severe systemic disease that is a constant threat to life (e.g. a child with status asthmaticus).

**Class V**  A moribund patient who is not expected to survive without the operation (e.g. a patient with severe cardiomyopathy requiring heart transplantation).
Consent for Operation

INDICATION AND OPERATION

Name of Operation for the Patient: _________________________________
Nature of Operation for the Patient:
☐ Restorations  ☐ Extractions  ☐ Surgical Extraction
☐ Trauma  ☐ Other: _________________________________

ANAESTHESIA TO BE USED

Local anaesthesia / N₂O:O₂ sedation / Intravenous sedation / General anaesthesia

GENERAL RISKS ASSOCIATED WITH THE OPERATION
The risks included:
☐ Postoperative wound pain, facial swelling and bruising
☐ Wound infection
☐ Others

RELEVANT TREATMENT OPTIONS

Besides this operation, the patient and/or the patient’s parent or guardian has other option(s): _________________________________
The other option(s): _________________________________
Their risks:

THE EXPLANATION GIVEN

The doctor(s) have fully explained the above to the patient and/or the patient’s parent or guardian. The doctor(s) have also indicated that they are welcome to discuss any further queries that they may have.
CONSENT

The doctor(s) have fully explained the above to me (the undersigned) which I fully understand. The doctor(s) also have answered the questions that I have asked. I, the undersigned, consent to undergo/consent to the Patient undergoing the above operation under the appropriate anaesthesia determined by the doctor(s). The doctor(s) has fully explained the nature, purpose, main risks and potential complications of the operation and the appropriate anaesthesia which I fully understand.

EXPLANATION OF THE PROPOSED OPERATION ON:

Date: __________________________
In the presence of the Patient and/or the patient’s parent or guardian.

_________________________________  ___________________________________________
Signature of Patient                           Signature of Patient’s parent or guardian

_________________________________  ___________________________________________
Signature of Doctor                           Signature of Witness

_________________________________  ___________________________________________
Name of Doctor in block letter                   Name of Witness in block letter
THE ANAESTHESIA AND ANAESTHIC RISKS

- Combination of general anaesthesia/ intravenous sedation / local anaesthesia will be used. Modern anaesthesia, in general, is safe. Risks may be increased due to co-existing problems, such as bad ‘cold’ or flu, smoking, being overweight, diabetes, heart disease, kidney disease, high blood pressure, and other serious medical conditions. Risks are also increased in the elderly. Serious complications form anaesthesia are extremely rare (1:200000). They include:
  (a) Breathing difficulties;
  (b) Stroke or brain damage, which may cause permanent disability;
  (c) Strain on the heart, which may result in heart attack;
  (d) Anaphylactic drug reactions;
  (e) Awareness whilst under general anaesthesia.

Our standard practice includes the use of comprehensive monitoring of vital signs to minimize those risks.
- Minor problems may occur. These include nausea and vomiting, general aches and pain, headaches, pain at operation and infection sites and sore throat.
- When possible, these problems are mostly avoided by using intravenous sedation with local anaesthesia.

THE EXPLANATION GIVEN

The doctor(s) have fully explained the above to the patient and/ or the patient’s parent or guardian. The doctor(s) have also indicated that they are welcome to discuss any further queries that they may have.
CONSENT

Date: _______________

In the presence of the Patient and/or the patient’s parent or guardian.

__________________________  ______________________________
Signature of Patient            Signature of Patient’s parent or guardian

__________________________  ______________________________
Signature of Doctor             Signature of Witness

__________________________  ______________________________
Name of Doctor in block letter  Name of Witness in block letter
APPENDIX D

Guidelines on Sedation for Dental Procedures in Paediatric Patients

**Appropriate Intake of Food and Liquids Before Sedation**

Fasting rules vary slightly between the countries, prior to intravenous sedation it is recommended that, the patient shall be fasted according to the following rules:

- No solid foods or non-clear liquids 6 hours before sedation

- No clear liquids 2 hours before sedation

Clear liquids are non-fruit juice, water, tea, and coffee. All milk products include e.g. Yakult (non-clear liquids) are considered as solid foods. Children under school age (< 6 years old) shall drink sugar containing clear liquid up to 2 hours before treatment in order to avoid low blood sugar.
Recommended Discharge Criteria

1. Cardiovascular function satisfactory and stable;
2. Airway patency uncompromised and satisfactory;
3. Patient easily arousable and protective reflexes intact;
4. Patient can drink and tolerate oral fluid without vomiting;
5. Patient can talk, if applicable;
6. Patient can sit unaided, if applicable;
7. Patient can ambulate, if applicable, with minimal assistance;
8. For the child who is very young or disabled, and incapable of the usually expected responses, the pre-sedation level of responsiveness or the level as close as possible for that child should be achieved;
9. Responsible individual is available to safely escort the patient;
10. The patient may have the ability to remain awake at least 20 minutes.
**Postoperative Patient Evaluation Questionnaire**

手術後狀況評估問卷

Name 姓名: ____________________  Sex 性別: M / F  
Phone no. 電話: ____________________  Patient No.: ____________________

Nature of operation 手術名稱: ____________________

Date of operation 日期: ____________________

**Discharge Assessment (before home)**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alert and orientated?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>神智清醒？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Observations are within normal limits?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>維生指數正常？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Taking and tolerating fluids/foods</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>能否正常飲食？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Able to stand and walk unaided</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>走動自如？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Wound checked?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>檢查傷口？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Is pain/nausea controlled?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>有沒有傷口痛或作嘔吐？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Venflon removed?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>拔掉靜脈喉管？</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Someone to take you home and look after you?</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>有沒有親人接送回家及照顧你？</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discharged by: _______________   Time of discharge: ________

Telephone Evaluation (after discharge home) Yes No

1. Any nausea or vomiting? (  ) (  )
   有沒有作嘔或嘔吐？

2. Any postoperative pain? (  ) (  )
   有沒有傷口痛？

3. Commenced eating a normal diet today? (  ) (  )
   能否正常飲食？

4. Return to your normal daily routine and activities? (  ) (  )
   能否正常活動？

5. Any elevated body temperature? (  ) (  )
   有沒有發燒？
**Guidelines on Sedation for Dental Procedures in Paediatric Patients**

**APPENDIX G**

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**Sedation Record**

Patient Name: ________________ D O B: ___/___/____ B.W. _____ kg

Clinic Reference No: ___________ Date of Procedure: ________________

Procedure: ______ □ Restoration □ Extraction □ M O S □ Implant

Operator: ______________________ Anaesthetist: ______________________

Technique: □ M A C □ IV Sedation □ N₂O sedation □ RA- Sedation

Medical History: □ No □ Yes Details: ____________________________

Drug Allergies: □ No □ Yes ASA: ______________________________

Fasting: □ Solid Food / Milk > 6 hours □ Clear Fluids > 2 hours

Procedure Explained: □ No □ Yes Patient Consent: □ No □ Yes

Escort: □ No □ Yes

Induction: □ Intravenous □ N₂O □ Sevoflurane

Oxygen Supplement: □ Room Air □ Supplement □ Nasal Cannula □ Mask

Maintenance: □ IV infusion □ Propofol Dose: ________________

Total Dose: __________________________________________

□ N₂O Concentration: ____ %

Other Drugs: __________________________________________

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Hong Kong Society of Paediatric Dentistry
IV Cannula: □ Hand/Arm □ Right □ Left
□ Ankle □ Right □ Left

Monitoring: □ Heart Rate □ SpO₂ □ NIBP
□ Cough Reflex Present Throughout

Recovery: □ Color Satisfactory □ Respiration Satisfactory
□ Conscious Level Satisfactory

SpO₂ Record
Equipment & Accessory Apparatus

**Essential:**
1. Anaesthetic monitor: Pulse oximeter (heart rate, blood pressure, blood oxygen concentration etc.)
2. Syringe pump (for Propofol)
3. Nitrous oxide / Oxygen (N₂O:O₂) machine with antihypoxic device
4. Adequate portable oxygen supply e.g. cylinder with flow meter to deliver O₂
5. Suction catheters or saliva ejectors;
6. Airway management equipment:
   - Size-appropriate oropharyngeal airways, nasal airways, oxygen masks, nasal cannulas, laryngoscope and blades, endotracheal tubes, self-inflating resuscitator bag
7. Intravenous access equipment:
   - Assorted IV catheters/needles, tourniquets, alcohol wipes, adhesive tapes, 3 way stopcocks, extension tube, normal saline, sterile water, sterile gauze pads
8. A device capable of measuring body temperature
9. Physical restraint device, e.g. binder
10. Stethoscope
11. Emergency electrical power and lighting
12. Manual suction apparatus (as back up)

**Desirable:**
1. Defibrillator (with size-appropriate paddles)
2. Oxygen concentrator
3. End-tidal CO₂ monitor / capnograph
4. Precordial stethoscope
5. Electrocardiography (ECG)
6. Anaesthetic gas vapourizer (e.g. for induction with Sevoflurane)
7. Laryngeal mask airway (LMA)
8. Intraosseous bone marrow needle
9. A proper scavenging system if gases other than oxygen or air are used
Emergency Drugs*

*The choice of emergency drugs may vary according to individual or procedural needs.

**Essential:**
1. Atropine
2. Diphenhydramine / Chlorpheniramine
3. Diazepam / Midazolam
4. Adrenalin (1:10,000)
5. Flumazenil
6. Glucose (50%)
7. Lignocaine (local infiltration)
8. Methyprednisolone / Hydrocortisone / Dexamethasone
9. Sodium bicarbonate
10. Succinylcholine

**Desirable:**
1. Datrolene
2. Phenytoin
3. Ampicillin
Further Readings


Available at: http://www.eapd.gr/Guidelines/index.htm


