GENERAL ANESTHESIA IN PEDIATRIC DENTISTRY
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Introduction

• Dentists who routinely treat children - encounter some patients - behavior cannot be managed adequately - even with medications and restrains

• Young children – lacking co-operative ability - extensive dental caries / systemic conditions / mentally challenged – indicated for pharmacological means of dental management
Introduction

• As a dentist, we must decide - represents acceptable behavior from dental patients

• If the behavior is unacceptable following behavior modification and conscious sedation - consider hospitalizing the patient to provide treatment

Definitions

Analgesia

• Diminution or elimination of pain

Local anesthesia

• Elimination of sensation, especially pain, in one part of the body by the topical application or regional injection of a drug

# Definitions

| Minimal sedation | • Minimally depressed level of consciousness - pharmacological method - retains ability to independently maintain airway, respond normally to tactile stimulation and verbal command  
• Cognitive function and coordination - modestly impaired  
• Ventilatory, cardiovascular functions - unaffected |
| Moderate sedation | • Drug-induced depression of consciousness - respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation  
• No interventions - required to maintain airway, spontaneous ventilation is adequate  
• Cardiovascular function - maintained |

## Definitions

| Deep sedation | Drug-induced depression of consciousness - cannot be easily aroused, respond purposefully - repeated or painful stimulation  
|               | Impaired ability to independently maintain ventilatory function  
|               | Assistance in maintaining a patent airway, spontaneous ventilation - inadequate  
|               | Cardiovascular function – maintained |

| General anesthesia (GA) | Drug-induced loss of consciousness - not arousable,  
|                         | Impaired ability to independently maintain ventilatory function  
|                         | Assistance - maintaining a patent airway, positive pressure ventilation - required  
|                         | Cardiovascular function may be impaired |

Pain and anxiety management system
For all levels of sedation - practitioner must have -

**Training / skills / drugs / equipment** to identify and manage such an occurrence until either assistance arrives (emergency medical service) or the patient returns to the intended level of sedation without airway or cardiovascular complications.
Safety of anesthetic agents

• Considering the number of patients treated under GA & conscious sedation
  - record of safety & efficacy of agents – truly remarkable

• D’Eramo, 1992 – average mortality incidence undergoing dental office anesthesia – 1:3,00,000

• Keenan RL, 1994 – 1 – 2 deaths / 10000 anesthetics

Safety of anesthetic agents

- Exact rates vary according to the study
- Generally agreed upon the safety of anesthesia as performed by competent practitioners according to the established standards of care
- Although most children will cope with dentistry in a normal setting, many may benefit from delivery of extensive dentistry in one session under GA

Safety of anesthetic agents

OBJECTIVE. We sought to use a large database of prospectively collected data on pediatric sedation and/or anesthesia for diagnostic and therapeutic procedures to delineate the nature and the frequency of adverse events that are associated with sedation/anesthesia care for procedures that are performed outside the operating room in children.

METHODS. Data were collected by the Pediatric Sedation Research Consortium, a collaborative group of 35 institutions that are dedicated to improving sedation/anesthesia care for children internationally. Members prospectively enrolled consecutive patients who were receiving sedation or anesthesia for procedures. Data on demographics, primary illness, coexisting illness, procedure performed, medications used, outcomes, airway interventions, and adverse events were collected and reported on a Web-based data collection tool.

RESULTS. A total of 26 institutions submitted data on 30,037 sedation/anesthesia encounters during the study period from July 1, 2004, to November 15, 2005. Serious adverse events were rare in the institutions involved in this study; there were no deaths. Cardiopulmonary resuscitation was required once. Less serious events were more common with O₂ desaturation below 90% for >30 seconds, occurring 157 times per 10,000 sedations. Stridor and laryngospasm both occurred in 4.3 per 10,000 sedations. Unexpected apnea, excessive secretions, and vomiting had frequencies of 24, 41.6, and 47.2 per 10,000 encounters, respectively.

CONCLUSIONS. Our data indicate that pediatric sedation/anesthesia for procedures outside the operating room is unlikely to yield serious adverse outcomes in a collection of institutions with highly motivated and organized sedation services. However, the safety of this practice depends on the systems’ ability to manage less serious events.
Safety of anesthetic agents

Adverse Sedation Events in Pediatrics: A Critical Incident Analysis of Contributing Factors

Charles J. Coté, MD*; Daniel A. Nottman, MD†; Helen W. Karl, MD‡; Joseph A. Weinberg, MD§; and Carolyn McCloskey, MD, MPH¶

ABSTRACT. Objective. Factors that contribute to adverse sedation events in children undergoing procedures were examined using the technique of critical incident analysis.

Methodology. We developed a database that consists of descriptions of adverse sedation events derived from the Food and Drug Administration’s adverse drug event reporting system, from the US Pharmacopeia, and from a survey of pediatric specialists. One hundred eighteen reports were reviewed for factors that may have contributed to the adverse sedation event. The outcome, ranging in severity from death to no harm, was noted. Individual reports were first examined separately by 4 physicians trained in pediatric anesthesiology, pediatric critical care medicine, or pediatric emergency medicine. Only reports for which all 4 reviewers agreed on the contributing factors and outcome were included in the final analysis.

Results. Of the 95 incidents with consensus agreement on the contributing factors, 81 resulted in death, 9 in permanent neurologic injury, 21 in prolonged hospitalization without injury, and in 14 there was no harm. Patients receiving sedation in nonhospital-based settings compared with hospital-based settings were older and healthier. The venue of sedation was not associated with the incidence of presenting respiratory events (eg, desaturation, apnea, laryngospasm, -80% in each venue) but more cardiac arrests occurred as the second (53.6% vs 14%) and third events (25% vs 7%) in nonhospital-based facilities. Inadequate resuscitation was rated as being a determinant of adverse outcome more frequently in nonhospital-based events (57.1% vs 2.3%). Death and permanent neurologic injury occurred more frequently in hospital-based facilities (92.8% vs 37.2%). Successful outcome (prolonged hospitalization without injury or no harm) was associated with the use of pulse oximetry compared with a lack of any documented monitoring that was associated with unsuccessful outcome (death or permanent neurologic injury). In addition, pulse oximetry monitoring of patients sedated in hospitals was uniformly associated with successful outcomes whereas in the nonhospital-based venue, 4 out of 5 suffered adverse outcomes. Adverse outcomes despite the benefit of an early warning regarding oxygenation likely reflect lack of skill in assessment and in the use of appropriate interventions, ie, a failure to rescue the patient.

Conclusions. This study—a critical incident analysis—identifies several features associated with adverse sedation events and poor outcome. There were differences in outcomes for venue: adverse outcomes (permanent neurologic injury or death) occurred more frequently in a nonhospital-based facility, whereas successful outcomes (prolonged hospitalization or no harm) occurred more frequently in a hospital-based setting. Inadequate resuscitation was more often associated with a nonhospital-based setting. Inadequate and inconsistent physiologic monitoring (particularly failure to use or respond appropriately to pulse oximetry) was another major factor contributing to poor outcome in all venues. Other issues rated by the reviewers were: inadequate sedation monitoring, medical evaluation, lack of an independent observer, medication errors, and inadequate recovery procedures. Uniform, specialty-independent guidelines for monitoring children during and after sedation are essential. Age and size-appropriate equipment and medications for resuscitation should be immediately available regardless of the location where the child is sedated.

All health care providers who sedate children, regardless of practice venue, should have advanced airway assessment and management training and be skilled in the resuscitation of infants and children so that they can successfully rescue their patient should an adverse sedation event occur. Pediatrics 2000;105:805–814; sedation, adverse events, critical incident, medication errors, monitoring, guidelines.
Uniqueness of pediatric patients

Central Nervous System

• Growth of CNS in newborn – extremely rapid

• Brain weight – doubles by age of 6 months, triples by 12 months

• 12 months – brain stem, cortex neuronal cell development – nearly complete

• Several anesthetic and sedative drugs – toxic to developing neurons
Uniqueness of pediatric patients

Cardiovascular System

• Heart of newborn – immature left ventricle and myocardium

• Heart rate

  • 6 month old – 120+/-20
  • 5 year old – 90+/-10
  • 12 year old – 70+/-17
Respiratory System

• Lungs of newborn – immature

• Growth in number of alveoli – after birth till 8 years

• Development of alveolar smooth muscle – begins after birth and continues till late childhood and adolescence

• Functional Reserve Capacity (FRC) – significantly smaller in children

• Nasal passage – narrow, large tongues, large tonsils, adenoids – upper airway blocked by secretions or edema
Uniqueness of pediatric patients

**Respiratory System**

- Vascular and fragile nature of tonsils – additional risk factor
- If tonsils – 50% of pharyngeal space – not good candidates for pharmacologic management
- Small lung capacity, higher metabolic rate – small O₂ reserve – quick desaturation of children
Uniqueness of pediatric patients

Body Size and Composition

• Centers for disease control and prevention – 1/3rd children in US – obese or overweight – at 5th birthday.

• Obesity affects the delivery of all levels of sedation and anesthesia
  • Maintenance of patent airway
  • Complicates airway management
  • Obstructive sleep apnea – difficulty in recovery after sedation
  • Venous access difficulty
  • Pharmacokinetics of drugs are affected
Uniqueness of pediatric patients

Special considerations in pedodontic anesthesia.

Trapp LD.

Abstract
Children are not small adults. Many anatomic, physiologic, pathophysiologic, pharmacologic, and psychological differences exist that require alterations in routine adult anesthetic procedures. An appreciation of these differences and their implications for general anesthesia allow the anesthetist to prevent most morbidity and mortality during pedodontic anesthesia, reduce dental and anesthesia-related fears and phobias, and assuage parental anxiety.
Hospital selection

- Established dental service / clinic
- Acceptance by the hospital’s physicians & administrator of the need to use GA to complete dental care for young children and handicapped
- Hospital staff experiences in using anesthesia for dental procedures
- Availability of operating room time & patient beds
- Outpatient general anesthesia service
- Pediatric department with personnel who understand the need of children during the hospital stay
- Availability of mobile, portable or modified dental equipment for providing dental care
- Close proximity to the dentist’s private office

Musselman and Roy, 1974 – suggested criteria for selection of a hospital for general practitioner

Indications for GA

- Patients with serious medical or anesthetic problems who may be compromised in out-patient, non-hospitalized environment
- Handi-capped medical conditions or disorders, whether they be physical, emotional or mental
- Emergency dental needs isolated from / in conjunction with emergency medical needs
- Patients in very young age categories who require special medical or anesthesia considerations
- Patients with oral disease who require special pre-operative diagnostic & consulting services – multidisciplinary health care team is desirable

Advantages of GA

- Patient cooperation is not absolutely essential
- The patient does not respond to pain
- Onset of action of GA is usually rapid
- The patient is unconscious during treatment
- Amnesia is present after the procedure
- Titration of drugs to produce the desired effect is possible

Disadvantages of GA

- Patient is unconscious during treatment
- Vital signs are depressed
- Patient protective reflexes are depressed
- Advanced training is required for the person administering GA
- A team of professionals (rather than an individual dentist) is required to provide treatment
- Special anesthesia equipment is required
- A recovery area must be available for postoperative monitoring

Objectives of GA

• Provide safe, efficient and effective dental care
• Eliminate anxiety
• Reduce untoward movement & reaction to dental treatment
• Aid in treatment of mentally, physically or medically compromised patient
• Eliminate the patient’s pain response

Use of GA sometimes is necessary to provide quality dental care for the child.

Depending on the patient - this can be done in a hospital / ambulatory setting in dental office.
Cardinal features of GA

- Loss of all sensations, especially pain
- Sleep and amnesia
- Immobility & muscle relaxation
- Abolition of somatic & automatic reflexes

## Properties of an ideal anesthetic

### For the patient
- Pleasant
- Non-irritating
- Should not cause nausea / vomiting
- Induction & recovery should be fast with no after effects

### For the surgeon
- It should provide adequate analgesia, immobility and muscle relaxation
- Non-inflammable & non-explosive – electric cautery may be used

### For the anesthetist
- Its administration should be easy, comfortable and versatile
- Wider margin of safety
- Potent – lower concentration can be used, oxygenation of the patient does not suffer
- Rapid adjustments in depth of anesthesia – should be possible
- Should be cheap, stable and easily stored

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Physical status classification system

- In 1962, American Society Of Anesthesiologist adopted the classification system
- Represents a method of estimating the medical risk factor presented by a patient about to undergo a surgical procedure in a hospital setting
- Designed primarily for patients about to receive a general anesthesia

## Physical status classification system

<table>
<thead>
<tr>
<th>ASA GRADE</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA Grade I</td>
<td>Normal healthy patient without any systemic disease</td>
</tr>
<tr>
<td>ASA Grade II</td>
<td>A patient with mild systemic disease</td>
</tr>
<tr>
<td>ASA Grade III</td>
<td>A patient with severe systemic disease</td>
</tr>
<tr>
<td>ASA Grade IV</td>
<td>A patient with severe systemic disease that is a constant threat to life</td>
</tr>
<tr>
<td>ASA Grade V</td>
<td>A moribund patient who is not expected to survive without the operation</td>
</tr>
<tr>
<td>ASA Grade VI</td>
<td>A declared brain-dead patient whose organs are being removed for donation</td>
</tr>
<tr>
<td>E</td>
<td>Emergency operation of any variety that precedes the member</td>
</tr>
</tbody>
</table>

Hospital procedures

- Initial history recording & examination
- Parental consultation
- Consultations & consent
- Pre-admissions
- Patient admittance
- Pre-operative procedure
- Equipment preparation
- Anesthesia induction
- Restorative procedures
- Post-operative procedures
- Discharge and follow-up care
Hospital procedures

Step 1 – Initial examination

• At the time of initial dental appointment – perform a complete examination, obtain patient’s medical history

Hospital procedures

Step 2 - Parental Consultation

• Discussion with the parent - need for hospital admission

• Describe the risks involved with general anesthesia

• If possible, give the parent an estimate of the expense of hospitalization, medical costs, cost of restorative procedures
Hospital procedures

Step 2 – Parental Consultation

• Outline the sequence for any necessary consultation, physical examination, dental insurance procedures, admission to the hospital

• Discuss the various preventive measures with the parent to avoid further oral health problems

• Emphasize that if there any problems / questions – parent to call for any information

Hospital procedures

Step 3 - Consultations

• Discuss with the child’s physician - the nature of the dental care, medical clearance for the dental care and anesthesia

• Any contra-indication – schedule the patient with appropriate physician, await consultation before scheduling the surgery

• Child’s physician will see the patient before admission or during admission for an updated medical survey & physical examination

Hospital procedures

Consent

• Specific **written consent** should be obtained at the time of treatment planning & updated on the day of operation

• Provides a suitable period of reflection for the parent / child


Hospital procedures

Blanket consent

• Broad based general consent – to do whatever is necessary

• “Restorations & extractions as necessary” is inadequate, except where it is agreed that an examination under anesthesia is required before treatment planning can be completed – has to be explained


Hospital procedures

Step 4 – Pre-admission

• If the patient has insurance coverage for dental care, prior authorization must be obtained before the performance of dental surgery

• Call the surgical scheduling office – arrange for a tentative time – for procedure & reservation of operation room suite

## Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Information to be submitted in surgical scheduling office</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Date of desired admission</td>
</tr>
<tr>
<td>2.</td>
<td>Name &amp; service of dentist &amp; physician</td>
</tr>
<tr>
<td>3.</td>
<td>Name, age &amp; sex of the patient</td>
</tr>
<tr>
<td>4.</td>
<td>Diagnosis &amp; appropriate days of hospital stay</td>
</tr>
<tr>
<td>5.</td>
<td>Accommodation required</td>
</tr>
<tr>
<td>6.</td>
<td>Parent’s name, address and telephone number</td>
</tr>
<tr>
<td>7.</td>
<td>Insurance company group</td>
</tr>
</tbody>
</table>

Hospital procedures

Step 5 – Patient Admittance

• Patient should report to admission office as per the directions according to date & time, with prescribed articles, insurance documents, signed consent, etc.

• Patient will get a hospital card, hospital chart, identification bracelet

• A financial screening will usually be accomplished at this time

• Consent form for anesthesia & surgery will be completed if it has not already been done

• Completion of this form is very important


Hospital procedures

- Nursing service for nursing notes
- Patient representative for social notes
- Physician for medical survey
- Dentist for pre-operative orders
- Anesthesiology for pre-anesthetic orders
- Laboratory technician for blood, urine, etc
- Radiology technician for chest radiograph

Patient will be visited in the ward by

Hospital procedures

Step 7 – Pre-operative Procedure

• Visit the patient in the ward after patient admission

• **Check the medical chart** for accuracy in the patient’s background data and consent

• Review admission nursing notes, **write admission notes** in the progress notes section

• Include the purpose of admission & general status of patient

# Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Information to be included</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Number of previous admission</td>
</tr>
<tr>
<td>2.</td>
<td>Patient background, social family history, health history, chief complaint, previous hospitalization &amp; surgeries</td>
</tr>
<tr>
<td>3.</td>
<td>General dental diagnosis</td>
</tr>
<tr>
<td>4.</td>
<td>Date &amp; time of prospective operation &amp; native of operation</td>
</tr>
<tr>
<td>5.</td>
<td>Any medical alerts</td>
</tr>
</tbody>
</table>

## Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Pre-operative orders in the physician orders section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Diet description &amp; restrictions</td>
</tr>
<tr>
<td>2.</td>
<td>Activities description &amp; restrictions</td>
</tr>
<tr>
<td>3.</td>
<td>Laboratory studies needed for anesthesia and surgical clearance</td>
</tr>
<tr>
<td>4.</td>
<td>Medications continuance &amp; special medications needed</td>
</tr>
<tr>
<td>5.</td>
<td>Consultations requests as needed</td>
</tr>
<tr>
<td>6.</td>
<td>On call for operating room</td>
</tr>
</tbody>
</table>

Hospital procedures

• Check to ensure pre-anesthetic evaluation is scheduled for anesthesiology

• Visit the patient – evening before surgery – purpose for late visit – to ensure the patient readiness for the surgery to follow

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Pre-operative visit notes should include</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Patient’s comfort</td>
</tr>
<tr>
<td>2.</td>
<td>Patient’s adjustment to hospital environment</td>
</tr>
<tr>
<td>3.</td>
<td>Patient’s vital signs &amp; appearance</td>
</tr>
<tr>
<td>4.</td>
<td>Laboratory results</td>
</tr>
<tr>
<td>5.</td>
<td>Consultations reports</td>
</tr>
<tr>
<td>6.</td>
<td>Anesthesia pre-operative orders</td>
</tr>
</tbody>
</table>
Hospital procedures

Step 8 – Equipment preparation

• During the week before the dental operation – make a list of all necessary equipment that must be in the operating room at the hospital

• All equipment that can be sterilized should be

• All other equipment & supplies – should be disinfected as possible

• Dentist & staff – should bring all the equipment – on the day of surgery

• In some hospitals, operating staff will scrub & sterilize the instruments before the dental appointment

# Hospital procedures

## Instrument Checklist

<table>
<thead>
<tr>
<th>No.</th>
<th>Instrument</th>
<th>Quantity</th>
<th>FC</th>
<th>Packed</th>
<th>Returned</th>
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<tbody>
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<td>1.</td>
<td>Instrument pack</td>
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<td></td>
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<tr>
<td>2.</td>
<td>Mouth Prop</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td>Classic Extractor</td>
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<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>Handpiece</td>
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<tr>
<td>5.</td>
<td>Bin Chuck</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Burs</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Small round</td>
<td>2</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium round</td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>Non cut cutting</td>
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<td>Proximal Sealing</td>
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<td></td>
<td>Occlusal reduction</td>
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<td></td>
<td>Composite finishing</td>
<td>Anti - 2</td>
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<td></td>
<td></td>
<td>Post - 2</td>
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<tr>
<td>7.</td>
<td>Files</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H files</td>
<td>2 sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K files</td>
<td>2 sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Kidney tray</td>
<td>4</td>
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<td></td>
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<tr>
<td>9.</td>
<td>Rectangular tray</td>
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<tr>
<td>10.</td>
<td>Sterile container</td>
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<tr>
<td>11.</td>
<td>Cotton rolls</td>
<td>4 packs</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Pallets</td>
<td>1 pack</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Cotton</td>
<td>2 packs</td>
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<td>14.</td>
<td>Encravates</td>
<td>2</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>15.</td>
<td>BIP Handle</td>
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<td></td>
<td></td>
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<tr>
<td>16.</td>
<td>BIP Blades</td>
<td>3</td>
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<tr>
<td>17.</td>
<td>Forecap</td>
<td>required</td>
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<td>18.</td>
<td>Elevator</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>19.</td>
<td>Strip crown scissors</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Metal scale</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>SSC</td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 22. | Strip crowns        | required |

- Fiber
- Crimping
- Contouring
- Straight Hoe
- Curved Hoe
- Crown Remover
- Band Packer
- Others

**Notes:**
Hospital procedures

• Many hospitals will furnish you with a nurse in the operating room – but their skills may be limited in the areas of dentistry

• It is advisable to bring one or two dental assistants from the dental office who are well trained in hospital operating room procedures & dental assisting

• Surgeon should arrive at the hospital – one hour before the operation

• Proceed to the surgical area – change the street clothes to surgical clothes

• All jewelry - to be kept in the locker

• Surgeon’s availability to be informed to nurse – patient’s floor can be notified for transport to the operating room suite
Emergency crash cart

• Any environment in which a patient may unexpectedly experience a medical emergency - needs an equipment to deal with that emergency efficiently

• Crash cart contains - equipment and medications - to treat a patient in the first 30 minutes or so of a medical emergency

Emergency crash cart

Basic cart contains:

- Basic airway equipment including bag valve masks, oral and nasal airways, oxygen masks and nasal cannulas, Magill forceps
- Intravenous access equipment (or intraosseous) including angiocaths, IV tubing and IV fluid. If the facility elects to utilize intraosseous access for emergency medications, then a drill and needles must be included.
- Medications utilized in the treatment of cardiac arrest including epinephrine and amiodarone.
- Medications utilized to treat cardiac dysrhythmias including adenosine, cardiazem, a beta blocker (usually Lopressor®), and Atropine.
- Monitor equipment with a defibrillator or an AED
- Medications to treat allergic reactions such as EpiPens®, Solu-medrol® and Benadryl®
  - Aspirin 81mg PO
  - Nitroglycerin spray or 0.4mg tablets

# Emergency crash cart checklist

## Equipment
- Airway (oral and nasal) all sizes
- McGill forceps, large and small
- King Airway set (3) eliminates the need for laryngoscope and endotracheal tubes
- Bag valve mask (adult and pediatric)
- Nasal cannula
- Non rebreather oxygen face masks (3 sizes)
- IV start packs
- Normal saline solution (1000ml bags)
- IV tubing
- Angiocaths (various sizes)
- 10ml normal saline flush syringes (3)
- Gauze
- Alcohol preps
- Monitor with defibrillator (preferred) or AED
- Syringe nasal adaptor (nasal naran atomizer)
- A checklist confirming everything that should be on the cart

## Drugs
- Aspirin 81mg Tablets
- Nitroglycerin spray or 0.4mg tablets
- Dextrose 50% (dextrose 25% if treating pediatrics)
- Narcan 1mg/ml (6)
- Epinephrine 1:10,000 Abboject™ (3)
- Atropine Sulfate 1mg Abboject™ (3)
- Amiodarone 150mg Vial (4)
- EpiPen® (2)
- EpiPen Jr® (2)
- Solumedrol 125mg vial
- Benadryl 50mg vial (2)
- Adenosine 6mg (4)
- Lopressor 10mg (2)
- Cardiazem 20mg vial (2)
- Pronestyl (procainamide) 1g in 10 ml 100mg/ml Vial (1)
Emergency crash cart

Maintenance of crash cart

Maintenance routine that should be completed at least monthly:

• **Expiration dates on medications** - checked on first day of the month
• **Expired medications** - promptly removed and replaced
• **Defibrillation pads on the AED or the defibrillator** - checked for expiration date
• **Battery charge** on the monitor and/or AED - checked & documented

Other checklists
Hospital procedures

Step 9 – Anesthesia Induction

• Arrange to meet your patient in the surgical holding area
• Patient will be pre-medicated
• Review the medical chart to ensure – all necessary data are in order
• Proceed to assigned operating room
• Dental assistant should pre-arrange the dental instruments & supplies before anesthesia induction
• Instruments are usually placed on Mayo stands

Hospital procedures

Patient will be brought into the operating room and transferred to the operating table from the mobile cart.

After the anesthesiologist had established monitoring devices, iv route, induction begins.

In younger children – induction may begin with a low percentage of anesthesia gases.

In older children – barbiturate may be used.

iv. Succinyl choline or a similar drug – administered to assist in induction.

Hospital procedures

Dentist should request **nasal intubation** – for maintenance of the anesthetic state

When anesthesiologist has completed the placement of nasal tube – **tube should be taped** in place of the child’s face & nose

Some anesthesiologists will place an **ophthalmic ointment** in eyes & tape them to prevent conjunctivitis & foreign bodies

Hospital procedures

Step 10 – Restorative procedures

Patient to be draped

For soft tissue surgical procedure
- gloves & sterilized secondary clothing
- mandatory

Pre-surgical scrub –operating surgeon & assistant

Petroleum jelly / other suitable lubricant – applied on patient’s lips

Throat pack – placed carefully by the dentist – using tied sponge material / sutured 5cm gauze

Hospital procedures

Step 10 – Restorative procedures

Radiographs if to be taken – accomplish as soon as possible

Routine prophylaxis – necessary scaling & polishing

Proceed with necessary dental care

Use rubber dam wherever possible

# Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Several rules of thumb are considered standard operating procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Any 2 or more surfaces of caries to be restored – stainless steel crown to be considered</td>
</tr>
<tr>
<td>2.</td>
<td>Any incipient interproximal / developmental pre-carious lesions should be restored</td>
</tr>
<tr>
<td>3.</td>
<td>There should be no heroic pulp therapy with the intent to use the procedure with the highest percentage of predicted success</td>
</tr>
<tr>
<td>4.</td>
<td>Indirect / direct pulp capping should be avoided as pulp procedures in primary teeth</td>
</tr>
<tr>
<td>5.</td>
<td>If there is doubt in pulpal success – remove the tooth</td>
</tr>
<tr>
<td>6.</td>
<td>Where possible in normal younger children, direct space maintainer should be fabricated</td>
</tr>
<tr>
<td>7.</td>
<td>All tissues removed – should be forwarded to the hospital pathologist for diagnosis &amp; signed report</td>
</tr>
</tbody>
</table>

### Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Several rules of thumb are considered standard operating procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Always keep the anesthesiologist informed – anticipated finishing time – time will influence anesthetic choice on the patient &amp; post-operative recovery time</td>
</tr>
<tr>
<td>2.</td>
<td>If oral surgical procedures were planned – do not leave to last – patient will recover without a proper period of time for you to evaluate post-operative hemorrhage</td>
</tr>
<tr>
<td>3.</td>
<td>Sutures – to be considered whenever possible</td>
</tr>
<tr>
<td>4.</td>
<td>About 15 minutes before finishing the procedure – anesthetist to be intimated – amount of gaseous anesthesia can be reduced</td>
</tr>
</tbody>
</table>


Hospital procedures

- After the procedure – patient will receive a high percentage of oxygen
- Rinse & thoroughly aspirate the mouth
- Gently remove the throat pack & inspect the area for any debris
- Anesthesiologist will use an aspirating tube to clear nasal area, pharynx, throat of debris & accumulated fluids
Step 11 – Post-operative Procedures

• **Do not leave** the operating room until the patient is extubated & reacting

• **Remain in the operating room & organize** the operative summary, post-operative orders & dictated operative report

• **Operative summary / record of operation** – brief form used in hospital for the purpose of detailing the parameters of the operation itself

## Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Operative summary list</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Names of surgeons &amp; assistants</td>
</tr>
<tr>
<td>2.</td>
<td>Pre-operative diagnosis</td>
</tr>
<tr>
<td>3.</td>
<td>Anesthesia type &amp; duration</td>
</tr>
<tr>
<td>4.</td>
<td>Post-operative diagnosis</td>
</tr>
<tr>
<td>5.</td>
<td>Surgical procedure description or charting</td>
</tr>
<tr>
<td>6.</td>
<td>Amount &amp; type of intra-venous fluids</td>
</tr>
<tr>
<td>7.</td>
<td>Tubes &amp; drains placed</td>
</tr>
<tr>
<td>8.</td>
<td>Closures &amp; sutures</td>
</tr>
<tr>
<td>9.</td>
<td>Pathology specimen submitted</td>
</tr>
<tr>
<td>10.</td>
<td>Complications</td>
</tr>
<tr>
<td>11.</td>
<td>Risks associated</td>
</tr>
<tr>
<td>12.</td>
<td>Post-operative condition of patient</td>
</tr>
</tbody>
</table>
Hospital procedures

- Post-operative orders - very important - these instruct other professionals in the hospital

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Post-operative orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vital signs recording</td>
</tr>
<tr>
<td>2.</td>
<td>Position of patient</td>
</tr>
<tr>
<td>3.</td>
<td>Lip &amp; nostril medication</td>
</tr>
<tr>
<td>4.</td>
<td>Removal of packs, etc</td>
</tr>
<tr>
<td>5.</td>
<td>Intra-venous fluids continuance</td>
</tr>
<tr>
<td>6.</td>
<td>Diet &amp; activities restriction</td>
</tr>
<tr>
<td>7.</td>
<td>Medication continuance &amp; commencement</td>
</tr>
<tr>
<td>8.</td>
<td>Special orders</td>
</tr>
<tr>
<td>9.</td>
<td>Patient discharge orders</td>
</tr>
<tr>
<td>10.</td>
<td>On-call information for dentist</td>
</tr>
</tbody>
</table>

Hospital procedures

• After the operative report, post-operative order & visited the patient in the recovery room – to go immediately to the patient’s ward or bed – to discuss the anesthesia & surgery with the parent or guardian

• Return to the surgical suite area – dictate operative summary – over telephone / dictating machine on a prescribed format
# Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Operative summary format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dictating physician</td>
</tr>
<tr>
<td>2.</td>
<td>Patient’s name</td>
</tr>
<tr>
<td>3.</td>
<td>Hospital number</td>
</tr>
<tr>
<td>4.</td>
<td>Date of operation</td>
</tr>
<tr>
<td>5.</td>
<td>Surgeon &amp; assistants</td>
</tr>
<tr>
<td>6.</td>
<td>Pre- &amp; post-operative diagnosis</td>
</tr>
<tr>
<td>7.</td>
<td>Name of operation</td>
</tr>
<tr>
<td>8.</td>
<td>Indications for surgery</td>
</tr>
<tr>
<td>9.</td>
<td>Gross findings</td>
</tr>
<tr>
<td>10.</td>
<td>Procedure – preparation, procedure, tissues removed, closure, drains, sponge and needle counts, condition of patient</td>
</tr>
</tbody>
</table>

Hospital procedures

- Return to the hospital & see the patient for a post-operative visit & write a post-operative visit note in the progress notes.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Routine Post-operative notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>General status of the patient (awake, asleep, agitated, crying)</td>
</tr>
<tr>
<td>2.</td>
<td>Vital signs: temperature, respiration, blood pressure, pulse</td>
</tr>
<tr>
<td>3.</td>
<td>Fluid balance: iv infusing, infiltrated or discontinued, patient voided or vomiting?</td>
</tr>
<tr>
<td>4.</td>
<td>Bleeding: clotting normally?</td>
</tr>
<tr>
<td>5.</td>
<td>Restoration: obvious restorations in disrepair</td>
</tr>
</tbody>
</table>

Hospital procedures

Step 12 – Discharge and follow-up care

• Review the patient’s progress & determine if the patient is ready for discharge

• Discharge orders – to summarize the hospital course & discharge status of the patient

<table>
<thead>
<tr>
<th></th>
<th>Discharge orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Date of admission</td>
</tr>
<tr>
<td>2</td>
<td>Diagnosis</td>
</tr>
<tr>
<td>3</td>
<td>Procedures performed</td>
</tr>
<tr>
<td>4</td>
<td>Complications</td>
</tr>
<tr>
<td>5</td>
<td>Discharge status</td>
</tr>
<tr>
<td>6</td>
<td>Date of discharge</td>
</tr>
<tr>
<td>7</td>
<td>Disposition</td>
</tr>
<tr>
<td>8</td>
<td>Follow-up</td>
</tr>
</tbody>
</table>

Hospital procedures

- General dental cases – follow-up – 1 week later in the dental office
- Other surgical procedures – periodontal / oral surgery – follow-up should be sooner
- All dictated reports accomplished at the hospital must be completed
- At the time of signing out – all dictated reports, review the chart for complications & designate that you have done so in the progress notes section of the chart
## Hospital procedures

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Discharge chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Patient identification</td>
</tr>
<tr>
<td>2.</td>
<td>Complaints</td>
</tr>
<tr>
<td>3.</td>
<td>Personal &amp; family history, history of presenting illness</td>
</tr>
<tr>
<td>4.</td>
<td>Physical examination</td>
</tr>
<tr>
<td>5.</td>
<td>Special report, consultations, lab reports</td>
</tr>
<tr>
<td>6.</td>
<td>Radiographs</td>
</tr>
<tr>
<td>7.</td>
<td>Provisional diagnosis</td>
</tr>
<tr>
<td>8.</td>
<td>Medical &amp; dental treatment</td>
</tr>
<tr>
<td>9.</td>
<td>Operative reports</td>
</tr>
<tr>
<td>10.</td>
<td>Pathologic findings</td>
</tr>
<tr>
<td>11.</td>
<td>Progress notes, final diagnosis, condition on discharge</td>
</tr>
<tr>
<td>12.</td>
<td>Discharge summary &amp; follow-up</td>
</tr>
</tbody>
</table>

Hospital procedures

• This step-by-step procedure follows the procedure used in most hospitals

• Dentist with careful planning in consultation with the hospital support staff – will find care for dental patients in the hospital a rewarding & enjoyable experiences
Ambulatory or outpatient anesthesia

- With higher cost of hospitalization for inpatient dental care, use of outpatient anesthesia for selected patients has increased
- Patient selection
  - Same ASA guidelines – but limit it with ASA 1 and 2
  - Ability of the parent to provide reliable pre- & post-operative & care for the child
  - Parent’s financial status

Ambulatory or outpatient anesthesia

Advantages of day-care procedure

- Tremendous monetary savings
- Reduction in the volume of records needed
- Effective & efficient use of medical personal time
- Reduction of psychologic trauma caused when the child is separated from parent

Changes in oral health-related quality of life among children following dental treatment under general anaesthesia. A systematic review.

Jankauskiene B, Narbutaite J

Abstract

AIM: To review the results of studies reporting data on changes in aspects of children's oral-health-related quality of life (OHRQoL) following dental treatment under general anaesthesia (GA). To describe instruments measuring children's OHRQoL used in the studies.

METHODS: A literature review was carried out to identify relevant studies reporting data on changes in aspects of children's OHRQoL following dental treatment under GA. The data was extracted from the selected papers.

RESULTS: The review included 11 journal articles, which presented the results of clinical trials. The studies were based on different questionnaires measuring children's OHRQoL and parental satisfaction.

CONCLUSIONS: Oral rehabilitation under GA results in the immediate improvement of children's oral health and physical, emotional and social quality of life. It also has a positive impact on the family. However, a more accurate comparison of results is not possible due to differences in instruments used. And no single decision exists on the choice of the instrument measuring children's OHRQoL following dental treatment under GA. It may be concluded that further studies on measuring long-term OHRQoL changes and studies surveying children are needed.


Abstract

BACKGROUND: Ketamine has been used as a safe and effective sedative to treat adults and children exhibiting high levels of anxiety or fear during dental treatment. Pediatric dentistry often involves patients with high levels of anxiety and fear and possibly few positive dental experiences. Patient management can involve behavioral approaches, as well as the use of sedation or general anesthesia with a variety of agents, including midazolam, diazepam, hydroxyzine, meperidine, and ketamine. The aim of this study was to investigate the clinical efficacy of ketamine use in pediatric sedation dentistry through systematic review and analysis.

METHODS: A systematic review of publications between 1990 and 2015 was conducted using PubMed and MEDLINE databases maintained by the US National Library of Medicine and the National Institutes of Health. The keywords used were (ketamine) AND (dental OR dentistry) AND (sedation). The abstract and title of all potential publications were then screened for clinical trials and to remove non-English articles, non-human or animal trials, and other non-dental or non-relevant studies.

RESULTS: A total of 1,657 citations were initially identified, reviewed, and screened, eventually resulting in inclusion of 25 clinical trials in this systematic review. Nineteen studies evaluated ketamine effects in pediatric dental sedation using oral (non-invasive) administration, three involved subcutaneous or intramuscular injection, and three were completed intravenously. Evidence analysis of these trials revealed the majority (n = 22/25) provided strong, positive evidence for the use of ketamine (alone or in combination) to reduce dental anxiety and behavioral non-compliance with the remainder suggesting equivocal results. Additional endpoints evaluated in some studies involved dosage, as well as time to achieve sedation effect.

CONCLUSION: The use of ketamine (alone or in combination) can provide safe, effective, and timely sedation in pediatric patients regardless of the route of administration.
AAPD Guidelines

Policy on Hospitalization and Operating Room Access for Oral Care of Infants, Children, Adolescents, and Individuals with Special Health Care Needs

Policy statement

The AAPD shall work with all concerned medical and dental colleagues and organizations to remove barriers to hospital and operating room access for oral care for patients best treated in those settings. The AAPD affirms that hospitals or outpatient settings providing surgical treatment should not discriminate against pediatric dental patients requiring care under general anesthesia. Such patients and their care providers need access to these facilities. The dental patient, as with any other patient, should have the right to be seen in a timely manner. Evidence has demonstrated dental treatment under general anesthesia in the operating room is a necessity, as well as an important component of comprehensive care, to assure optimal health for many, especially those considered high-risk."
AAPD Guidelines

Suggested Management of Airway Obstructions

- Reposition the airway
  - successful
  - unsuccessful
- Perform a jaw thrust
  - successful
  - unsuccessful
- Insert oral airway
  - successful
  - unsuccessful
- Call for help
- Insert nasal trumpet
  - successful
  - unsuccessful
- Insert supraglottic device (LMA or other)
  - successful
  - unsuccessful
- Tracheal intubation
  - successful
  - unsuccessful
- Surgical airway

Suggested Management of Laryngospasm

- Positive pressure ventilation
  - successful
  - unsuccessful
- Deepen sedation, e.g., propofol
  - successful
  - unsuccessful
- Call for help
- Give muscle relaxant (Succinylcholine + atropine unless contraindicated)
  - successful
  - unsuccessful
- Tracheal intubation
  - successful
  - unsuccessful
- Surgical airway

## AAPD Guidelines

Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016

### Table 2. COMPARISON OF MODERATE AND DEEP SEDATION EQUIPMENT AND PERSONNEL REQUIREMENTS

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>An observer who will monitor the patient but who may also assist with interruptible tasks; should be trained in PALS</td>
<td>An independent observer whose only responsibility is to continuously monitor the patient; trained in PALS</td>
<td></td>
</tr>
<tr>
<td>Skilled to rescue a child with apnea, laryngospasm, and/or airway obstruction including the ability to open the airway, suction secretions, provide CPR, and perform successful bag-valve-mask ventilation; recommended that at least 1 practitioner should be skilled in obtaining vascular access in children; trained in PALS</td>
<td>Skilled to rescue a child with apnea, laryngospasm, and/or airway obstruction, including the ability to open the airway, suction secretions, provide CPR, perform successful bag-valve-mask ventilation, tracheal intubation, and cardiopulmonary resuscitation; training in PALS is required; at least 1 practitioner skilled in obtaining vascular access in children immediately available</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse oximetry</td>
<td>Pulse oximetry</td>
<td>Heart rate</td>
</tr>
<tr>
<td>ECG recommended</td>
<td>ECG required</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>Heat rate</td>
<td>Heart rate</td>
<td>Respiration</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Blood pressure</td>
<td>Capnography required</td>
</tr>
<tr>
<td>Respiration</td>
<td>Respiration</td>
<td></td>
</tr>
<tr>
<td>Capnography recommended</td>
<td>Capnography recommended</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other equipment</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suction equipment, adequate oxygen source/supply</td>
<td>Suction equipment, adequate oxygen source/supply, defibrillator required</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Documentation</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name, route, site, time of administration, and dosage of all drugs administered</td>
<td>Name, route, site, time of administration, and dosage of all drugs administered, continuous oxygen saturation, heart rate, and ventilation (capnography recommended); parameters recorded every 10 minutes</td>
<td></td>
</tr>
<tr>
<td>Continuous oxygen saturation, heart rate, and ventilation (capnography recommended); parameters recorded every 10 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency checklists</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended</td>
<td>Recommended</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rescue cart property stocked with rescue drugs and age- and size-appropriate equipment (see Appendices 3 and 4)</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td>Required</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dedicated recovery area with rescue cart property stocked with rescue drugs and age- and size-appropriate equipment (see Appendices 3 and 4) and dedicated recovery personnel; adequate oxygen supply</th>
<th>Moderate sedation</th>
<th>Deep sedation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended; initial recording of vital signs may be needed at least every 10 minutes until the child begins to awaken, then recording intervals may be increased</td>
<td>Recommended; initial recording of vital signs may be needed for at least 5-minute intervals until the child begins to awaken, then recording intervals may be increased to 10-15 minutes</td>
<td></td>
</tr>
</tbody>
</table>
AAPD Guidelines

Minimum requirements for a time-based anesthesia record

Vital signs

• Pulse and respiratory rates
• Blood pressure
• Heart rhythm
• Oxygen saturation

• Expired CO2 must be continuously monitored and recorded on a time-based record throughout the procedure, initially every five minutes and then, as the patient awakens, at 10-15 minute intervals until the patient has met documented discharge criteria.

Minimum requirements for a time-based anesthesia record

Drugs

- Name, dose, route, site, time of administration
- Patient effects (e.g., Level of consciousness, patient responsiveness) of all drugs, including local anesthesia, must be documented
- When anesthetic gases are administered, inspired concentration and duration of inhalation agents and oxygen shall be documented

Minimum requirements for a time-based anesthesia record

Recovery

• Condition of the patient, that discharge criteria have been met, time of discharge, and into whose care the discharge occurred must be documented

• Requiring the signature of the responsible adult to whom the child has been discharged, verifying that he/she has received and understands the post-operative instructions, is encouraged

AAPD Guidelines Use of Anesthesia Providers in the Administration of Office-based Deep Sedation/General Anesthesia to the Pediatric Dental Patient

- Clinicians may consider using deep sedation or general anesthesia in the office to facilitate the provision of oral health care.

- Practitioners choosing to use these modalities must be trained in rescue emergency procedures and be familiar with their patient’s medical history, regulatory and professional liability insurance requirements needed to provide this level of pharmacologic behavior management.

- This guideline does not supersede, nor is it to be used in deference to, federal, state, and local credentialing and licensure laws, regulations, and codes.

**Sedation versus general anaesthesia for provision of dental treatment to patients younger than 18 years (Review)**

Ashley PF, Williams CECS, Moles DR, Parry J

**Objectives**

We will evaluate morbidity and effectiveness of sedation versus GA for provision of dental treatment to patients younger than 18 years. If data become available, we will analyse the cost-effectiveness of different interventions. If data are not available, we will obtain crude estimates of cost.

Morbidity can be defined as 'an undesired result or complication'. For the purposes of this review, 'postoperative morbidity' refers to undesired results or complications such as nausea following a procedure, once the patient had been restored to consciousness and could breathe unaided. 'Intraoperative morbidity' refers to any complications that occur during the procedure that may necessitate action by the anaesthetist or the sedationist, such as respiratory arrest.
Sedation versus general anaesthesia for provision of dental treatment to patients younger than 18 years (Review)

Ashley PF, Williams CECS, Moles DR, Parry J

Authors' Conclusions

Implications for practice

We found no RCTs comparing general anaesthesia versus sedation for children and adolescents undergoing dental treatment. Therefore, we are not able to make recommendations about use of sedation or general anaesthesia for provision of dental treatment in patients younger than 18 years.

Implications for research

Carefully designed and well-run RCTs are required to compare sedation versus GA for provision of dental treatment to children and adolescents. At present, none have been conducted.
Conclusion

• As a dentist, we must decide what represents acceptable behavior from dental patients

• If the behavior is unacceptable following behavior modification & conscious sedation – we should consider hospitalizing the patient to provide treatment
References


References


• Dougherty, N. The dental patient with special needs: a review of indications for treatment under general anesthesia. Special Care in Dentistry, 2009; 29(1), 17–20.
References


• Ashley PF, Williams CECS, Moles DR, Parry J. Sedation versus general anaesthesia for provision of dental treatment to patients younger than18 years. Cochrane Database of Systematic Reviews 2015, Issue 9.