RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE and Versions(R)

Search Strategy:

1 exp *Anesthesia, Dental/ (7840)
2 exp *Conscious Sedation/ (5588)
3 (anesthesia$ or anesth$ or sedation or sedat$).ti. (151745)
4 2 or 3 (152620)
5 (dental or dentist$ or tooth or teeth or "oral surg$").tw. (337281)
6 4 and 5 (5662)
7 limit 4 to dentistry journals (6920)
8 1 or 6 or 7 (11843)
9 limit 8 to english language (8746)
10 limit 9 to (*review" or systematic reviews) (611)
11 review.ti. and 9 (215)
12 10 or 11 (700)
13 limit 12 to yr="2015 -Current" (94)
14 exp animals/ not humans/ (4589760)
15 13 not 14 (93)
16 (feline$ or cat or cats or dog or dogs or rat or rats or mice or monkey$ or macaque$ or minipig$).tw. (2480102)
17 15 not 16 (93)

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tile
Effect of clonidine on the efficacy of lignocaine local anesthesia in dentistry: A systematic review and meta-analysis of randomized, controlled trials. [Review]

Source

Abstract
Alternatives to adrenaline with lignocaine local anesthesia, such as clonidine, have been trialed in various randomized, controlled trials. Therefore, the aim of the present systematic review was to compile the available evidence on using clonidine with lignocaine for dental anesthesia. Electronic databases were searched for eligible studies. A data-extraction form was created, extracted data were analyzed using non-Cochrane mode in RevMan 5.3 software. Heterogeneity between the studies were assessed using the forest plot, I² statistics (where >50% was considered to have moderate-to-severe heterogeneity), and chi²-test. Random-effects models were used because of moderate heterogeneity. Five studies were included for the final review. While clonidine was found to significantly shorten the onset of local anesthesia when measured subjectively, no significant difference was observed objectively. No significant difference was observed in the duration and postoperative analgesia. Stable hemodynamic parameters within the safe range were observed postoperatively when clonidine was used. Clonidine could be considered as an alternative to adrenaline in cases of contraindications to adrenaline, such as like cardiac abnormalities, hypertension, and diabetes.

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Title
Videolaryngoscopy vs. direct laryngoscopy use by experienced anaesthetists in patients with known difficult airways: a systematic review and meta-analysis. [Review]

Source
Anaesthesia. 2017 Sep 22.

Abstract
Experienced anaesthetists can be confronted with difficult or failed tracheal intubations. We performed a systematic review and meta-analysis to ascertain if the literature indicated if videolaryngoscopy conferred an advantage when used by experienced anaesthetists managing patients with a known difficult airway. We searched PubMed, MEDLINE, Embase and the Cochrane central register of controlled trials up to 1 January 2017. Outcome parameters extracted from studies were: first-attempt success of tracheal intubation; time to successful intubation; number of intubation attempts; Cormack and Lehane grade; use of airway adjuncts (e.g. stylet, gum elastic bougie); and complications (e.g. mucosal and dental trauma). Nine studies, including 1329 patients, fulfilled the inclusion criteria. First-attempt success was greater for all videolaryngoscopes (OR 0.34 (95%CI 0.18-0.66); p = 0.001). Use of videolaryngoscopy was associated with a significantly better view of the glottis (Cormack and Lehane grades 1 and 2 vs. 3-4, OR 0.04 (95%CI 0.01-0.15); p < 0.00001). Mucosal trauma occurred less with the use of videolaryngoscopy (OR 0.16 (95%CI 0.04-0.75); p = 0.02). Videolaryngoscopy has added value for the experienced anaesthetist, improving first-time success, the view of the glottis and reducing mucosal trauma.

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Title
The use of general anaesthesia to facilitate dental treatment in adult patients with special needs. [Review]

Source

Abstract
General anesthesia is commonly used to facilitate dental treatment in patients with anxiety or challenging behavior, many of whom are children or patients with special needs. When performing procedures under general anesthesia, dental surgeons must perform a thorough pre-operative assessment, as well as ensure that the patients are aware of the potential risks and that informed consent has been obtained. Such precautions ensure optimal patient management and reduce the frequency of morbidities associated with this form of sedation. Most guidelines address the management of pediatric patients under general anesthesia. However, little has been published regarding this method in patients with special needs. This article constitutes a review of the current literature regarding management of patients with special needs under general anesthesia.

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2017
Use of local anesthetics for dental treatment during pregnancy; safety for parturient. [Review]

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Title
Use of local anesthetics for dental treatment during pregnancy; safety for parturient. [Review]

Source

Abstract
Pregnancy induces significant anatomical and physiological changes in the mother. Many pregnant women need dental treatment due to poor oral hygiene related to pregnancy. However, most dentists are reluctant to provide, and most pregnant women are reluctant to receive, dental treatment during pregnancy. Theoretically, maternally administered drugs are transferred to the fetus. Depending on the types of drugs and the stage of pregnancy, the effects of drugs on the mother, as well as the fetus, may vary. Local anesthetics are the most widely used in dental treatment. It is, therefore, important to understand the potential effects of local anesthetics during pregnancy. In this review, we will focus on the maternal and fetal effects of local anesthetics widely used in dental treatment with consideration of the use of local anesthetics during pregnancy.

Death Rate of Dental Anaesthesia. [Review]

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Title
Death Rate of Dental Anaesthesia. [Review]

Source

Abstract
Death was the most important side effect of anaesthesia in dentistry. In this article we reviewed more than 20 studies with adequate data focusing on death associated with dental procedures since 1955 and found 218 deaths out of 71,435,282 patients (3 deaths per 1,000,000 persons) with the mortality rate of 1:327,684. In addition, mortality rate per million has dropped to half (6.2 per 1,000,000 vs. 3 per 1,000,000) since 1955 till the last report in 2012 without any sex predilection. In children, most cases died in the age of two to five years. Hypoxia was the most common cause of death, and cardiovascular, respiratory, and endocrine disorders, hepatic cirrhosis, septicemia, and bacterial endocarditis were the most frequent underlying systemic disease in deceased patients. Although rare death following general anaesthesia in dentistry, is a critical side effect mostly seen in patients with compromised health condition. Therefore, appropriate case selection in regard with patients' general health status as well as standard technical and equipment conditions are mandatory to diminish the risk of death during dental anaesthesia.
**Recent Reviews Related to Dental Anaesthesia/Sedation**

### PubMed - not MEDLINE

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**Title**
Conscious Sedation: Emerging Trends in Pediatric Dentistry. [Review]

**Source**

**Abstract**
Dental fear and anxiety is a common problem in pediatric patients. There is considerable variation in techniques used to manage them. Various sedation techniques using many different anesthetic agents have gained considerable popularity over the past few years. Children are not little adults; they differ physically, psychologically, and emotionally. The purpose of this review is to survey recent trends and concerning issues in the rapidly changing field of pediatric sedation. We will study the topic from the perspective of an anesthesiologist. It will also provide information to practitioners on the practice of conscious sedation in dentistry and will also outline the route of administration, pharmacokinetics, and pharmacodynamics of various drugs used.

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**Title**
Nitrous Oxide and Midazolam Sedation: A Systematic Review and Meta-Analysis.

**Source**
Anesthesia Progress. 64(2):59-65, 2017 Summer, Summer.

**Local Messages**
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**Abstract**
Nitrous oxide and midazolam have been used as sedative agents to decrease fear and anxiety associated with dental procedures. Although these agents have been widely used individually, the combination of the two is also commonly used. Four clinical trials were identified that compared the combination technique with the individual use of the drugs. The standardized mean difference (SMD) for each outcome measure was considered for final analysis. Three studies with 534 participants were included in the final meta-analysis, and the SMD [95% CI] was obtained as -0.15 [-0.32, 0.03] and was not statistically significant for cooperation scores. Two studies reported the dose of midazolam required for inducing sedation in 450 participants, and the pooled estimate of SMD [95% CI] was obtained as -0.29 [-0.48, -0.10] and was significant. Two studies with 450 participants reported the time taken to recover from sedation, and the pooled estimate of SMD [95% CI] was obtained as -0.20 [-0.39, -0.01] and favored the combination technique. To conclude, the combination technique combines the pros and cons of both drugs in causing fewer adverse effects due to midazolam by reducing the total dose and also helps to provide better acceptance of nitrous oxide inhalation.

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Title
Change in children's oral health-related quality of life following dental treatment under general anaesthesia for the management of dental caries: a systematic review. [Review]

Source

Abstract
BACKGROUND: Dental caries has significant impact on children and their families and may necessitate treatment under general anaesthesia (GA). The use of oral health-related quality-of-life (OHRQoL) measures enables evaluation of dental treatment from a patient's perspective.

OBJECTIVE: This systematic review aimed to assess change in OHRQoL in children following treatment under GA for the management of dental caries.

METHODS: A comprehensive search was conducted to identify articles which were assessed against inclusion criteria before data extraction. Studies involving children under 16 years, having treatment for dental caries under GA, were considered eligible. Included studies were quality assessed.

RESULTS: Twenty studies were included, which demonstrated significant heterogeneity. Most studies employed a pre-test-post-test design. All but one study relied on proxy reports of OHRQoL. Only half the studies used instruments validated in the study population. Whereas all studies reported improved OHRQoL overall, some subscales showed changes which were not significant or worsened OHRQoL. The scientific quality of the studies varied considerably.

CONCLUSION: Heterogeneity of included papers limited the conclusions which could be drawn. Treatment under GA appears to result in overall improvements in proxy-reported OHRQoL; however, there is a need for further high-quality studies employing validated, child-reported measures of OHRQoL.

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Title
Delivery of anesthesia for children with Mucopolysaccharidosis Type III (Sanfilippo syndrome): a review of 86 anesthetics.

Source

Abstract
BACKGROUND: Sanfilippo syndrome (MPS III) is rare, with 97 cases in the United Kingdom between 1988 and 1998. Mucopolysaccharide infiltration of tissues in mucopolysaccharidosis (MPS) causes multi-systemic pathology including difficult airways and cardiac disease. Published anesthesia case reviews of Sanfilippo syndrome have included limited numbers of patients to date.

AIM: To identify the perioperative management and complications of anesthesia in children with mucopolysaccharidosis Type III at Great Ormond Street Hospital.
METHODS: A retrospective case note review of all children with MPS III in our institution was undertaken. All medical notes and anesthetic charts were analyzed, and conduct of anesthesia, airway management, perioperative complications, and associated comorbidities were identified.

RESULTS: There were 43 patients with MPS III, of which 34 required anesthesia, on 86 occasions for 156 procedures between 1993 and 2015. Dental extraction was the likeliest indication for anesthesia (34%) (general surgery [30%]; ear, nose, and throat [26%]; other [10%]). Thirteen of 34 patients had cardiac pathology (valvular [n = 6], functional [n = 6], electrophysiological [n = 1]). Ten of 34 patients had evidence of clotting abnormality (mild prolonged clotting time [n = 5], low von Willebrand factor [n = 2], thrombocytopenia [n = 3]). The majority of intubations were Cormack-Lehane Grade 1 (n = 47) (Grade 2 [n = 14], Grade 3 [n = 1], Grade 4 [n = 1]). In 86 anesthetics, there were 0 cases of difficulty with mask ventilation. There was 1 case of failed intubation. They were subsequently anesthetized by a different operator uneventfully at a later date. Two perioperative complications occurred: a failed intubation and bleeding during adenoidectomy.

CONCLUSION: We demonstrate a difficult airway is unlikely when anesthetizing an MPS III patient although a risk does remain. A significant proportion of MPS III have cardiac involvement although no perioperative complications were described. With associated coagulation issues, bleeding tendency, while uncommon, can occur in this group.

A significant proportion of MPS III have cardiac involvement although no perioperative complications were described. With associated coagulation issues, bleeding tendency, while uncommon, can occur in this group.

A significant proportion of MPS III have cardiac involvement although no perioperative complications were described. With associated coagulation issues, bleeding tendency, while uncommon, can occur in this group.

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Evaluation of Three Block Anesthesia Methods for Pain Management During Mandibular Third Molar Extraction: A Meta-analysis

A patient's pain during mandibular third molar extraction often creates problems for a dental surgeon and can also cause immense patient discomfort, such as decreased quality of life, serious complications, or even danger to the patients’ lives. Effective pain management is therefore of great importance. Conventional block anesthesia method often fails to control such pain completely during an operation. Therefore, two available alternatives, Gow-Gates (G-G) and Vazirani-Akinsi (V-A) methods, have been developed. However, the results of current studies regarding their effectiveness and safety are somewhat ambiguous. The use of G-G and V-A techniques is therefore restricted. This study did a comprehensive review of the relevant research and finally 7 RCTs were included. The results of this meta-analysis indicate that both G-G and V-A techniques have a lower risk of positive aspiration. G-G technique also evidenced a higher success rate than the conventional method. V-A was faster while the G-G technique in contrast had a slower onset time than the conventional technique. In terms of the measurement of analgesic success, however, the V-A method was statistically indistinguishable from conventional techniques. These findings will hopefully endow clinicians with the knowledge required to make appropriate choices for effective anesthesia during lower third molar extraction.
Abstract

Type 2 diabetes is a disease of metabolism in which the afflicted patient cannot properly utilize carbohydrates, fats, and proteins. Because the prevalence of type 2 diabetes is rapidly increasing throughout the general population, anesthesia providers must realize that a significant percentage of their patients will present with the disease. Anesthesia providers should have an intimate knowledge of the comorbidities and complications that are associated with type 2 diabetes and know the specific pharmacokinetics and pharmacodynamics of the drugs used to treat the disease. Part 1 of this series on the anesthetic management of type 2 diabetes in the ambulatory theater addressed the pathology of diabetes and its comorbid disease states. Part 2 of the series now focuses on the pharmacology associated with the many medications used to treat the disorder and the most recent guidelines for blood glucose management recommended for patients in an ambulatory surgery setting.

Abstract

Mitochondrial disease (MD) represents a category of metabolic disorders with a wide range of symptoms across a variety of organ systems. It occurs with an incidence of greater than 1:5000 and can be difficult to specifically diagnose because of the variety of clinical presentations and multiple genomic origins. Although phenotypically variable, MD symptoms often include hypotonia, cardiac defects, dysautonomia, and metabolic dysfunction. Mitochondrial disease presents a unique challenge in terms of anesthetic management, as many anesthetic drugs suppress mitochondrial function. Additional considerations may need to be made in order to evaluate the patient's metabolic compensation prior to surgery. This article presents an in-depth discussion of a case involving a nearly 10-year-old boy with a history of an unspecified form of MD, who presented for endodontic treatment of
Recent advances and perspectives in topical oral anesthesia. [Review]

INTRODUCTION: Topical anesthesia is widely used in dentistry to reduce pain caused by needle insertion and injection of the anesthetic. However, successful anesthesia is not always achieved using the formulations that are currently commercially available. As a result, local anesthesia is still one of the procedures that is most feared by dental patients. Drug delivery systems (DDSs) provide ways of improving the efficacy of topical agents. Areas covered: An overview of the structure and permeability of oral mucosa is given, followed by a review of DDSs designed for dental topical anesthesia and their related clinical trials. Chemical approaches to enhance permeation and anesthesia efficacy, or to promote superficial anesthesia, include nanostructured carriers (liposomes, cyclodextrins, polymeric nanoparticle systems, solid lipid nanoparticles, and nanostructured lipid carriers) and different pharmaceutical dosage forms (patches, bio- and mucoadhesive systems, and hydrogels). Physical methods include pre-cooling, vibration, iontophoresis, and microneedle arrays. Expert opinion: The combination of different chemical and physical methods is an attractive option for effective topical anesthesia in oral mucosa. This comprehensive review should provide the readers with the most relevant options currently available to assist pain-free dental anesthesia. The findings should be considered for future clinical trials.

Recent Reviews Related to Dental Anaesthesia/Sedation
PURPOSE: The objective of this study was to evaluate the efficacy of hypotensive anesthesia in reducing intraoperative blood loss, duration of operation, and quality of surgical field during orthognathic surgery: A systematic review and meta-analysis of randomized controlled trials addressing these issues were carried out.

RESULTS: Ten randomized controlled trials were included for analysis. Our meta-analysis indicated that hypotensive anesthesia reduced intraoperative blood loss by a mean of about 169 mL. Hypotensive anesthesia was not shown to reduce the operation time for orthognathic surgery, but it did improve the quality of the surgical field. Subgroup analysis indicated that for blood loss in double-jaw surgery, the weighted mean difference favored the hypotensive group, with a reduction in blood loss of 175 mL, but no statistically significant reduction in blood loss was found for anterior maxillary osteotomy. If local anesthesia with epinephrine was used in conjunction with hypotensive anesthesia, the reduction in intraoperative blood loss was increased to 254.93 mL.

CONCLUSIONS: Hypotensive anesthesia was effective in reducing blood loss and improving the quality of the surgical field, but it did not reduce the operation time for orthognathic surgery. The use of local anesthesia in conjunction with hypotensive general anesthesia further reduced the amount of intraoperative blood loss for orthognathic surgery.

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Title
Effects of Hypotensive Anesthesia on Reducing Intraoperative Blood Loss, Duration of Operation, and Quality of Surgical Field During Orthognathic Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. [Review]
Recent advances and perspectives in topical oral anesthesia. [Review]

INTRODUCTION: Topical anesthesia is widely used in dentistry to reduce pain caused by needle insertion and injection of the anesthetic. However, successful anesthesia is not always achieved using the formulations that are currently commercially available. As a result, local anesthesia is still one of the procedures that is most feared by dental patients. Drug delivery systems (DDSs) provide ways of improving the efficacy of topical agents. Areas covered: An overview of the structure and permeability of oral mucosa is given, followed by a review of DDSs designed for dental topical anesthesia and their related clinical trials. Chemical approaches to enhance permeation and anesthesia efficacy, or to promote superficial anesthesia, include nanostructured carriers (liposomes, cyclodextrins, polymeric nanoparticle systems, solid lipid nanoparticles, and nanostructured lipid carriers) and different pharmaceutical dosage forms (patches, bio- and mucoadhesive systems, and hydrogels). Physical methods include pre-cooling, vibration, iontophoresis, and microneedle arrays. Expert opinion: The combination of different chemical and physical methods is an attractive option for effective topical anesthesia in oral mucosa. This comprehensive review should provide the readers with the
most relevant options currently available to assist pain-free dental anesthesia. The findings should be considered for future clinical trials.

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Title
Smart syringe pumps for drug infusion during dental intravenous sedation. [Review]

Source

Abstract
Dentists often sedate patients in order to reduce their dental phobia and stress during dental treatment. Sedatives are administered through various routes such as oral, inhalation, and intravenous routes. Intravenous administration has the advantage of rapid onset of action, predictable duration of action, and easy titration. Typically, midazolam, propofol or dexmedetomidine are used as intravenous sedatives. Administration of these sedatives via infusion by using a syringe pump is more effective and successful than infusing them as a bolus. However, during intravenous infusion of sedatives or opioids using a syringe pump, fatal accidents may occur due to the clinician's carelessness. To prevent such risks, smart syringe pumps have been introduced clinically. They allow clinicians to perform effective sedation by using a computer to control the dose of the drug being infused. To ensure patient safety, various alarm features along with a drug library, which provides drug information and prevents excessive infusion by limiting the dose, have been added to smart pumps. In addition, programmed infusion systems and target-controlled infusion systems have also been developed to enable effective administration of sedatives. Patient-controlled infusion, which allows a patient to control his/her level of sedation through self-infusion, has also been developed. Safer and more successful sedation may be achieved by fully utilizing these new features of the smart pump.

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Title
Developmental procedures for the clinical practice guidelines for conscious sedation in dentistry for the Korean Academy of Dental Sciences.

Source

Abstract
BACKGROUND: Evidence-based clinical practice guidelines (CPGs) are defined as "statements that are scientifically reviewed about evidence and systematically developed to assist in the doctors’ and patients’ decision making in certain clinical situations." This recommendation aims to promote good clinical practice for the provision of safe and effective practices of conscious sedation in dentistry.

METHODS: The development of this clinical practice guideline was conducted by performing a systematic search of the literature for evidence-based CPGs. Existing guidelines, relevant systematic reviews, policy documents, legislation, or other recommendations were reviewed and appraised. To supplement this information, key questions were formulated by the Guideline Development Group and used as the basis for designing systematic literature search strategies to identify literature that may address these questions. Guideline documents were evaluated through a review of domestic and international databases for the development of a renewing of existing conscious sedation guidelines for dentistry. Clinical practice guidelines were critically appraised for their methodologies using Appraisal of guidelines for research and evaluation (AGREE) II.

RESULTS: A total of 12 existing CPGs were included and 13 recommendations were made in a range of general, adult, and pediatric areas.

CONCLUSION: The clinical practice guidelines for conscious sedation will be reviewed in 5 years' time for further updates to reflect significant changes in the field.

Abstract
Topical anesthetics act on the peripheral nerves and reduce the sensation of pain at the site of application. In dentistry, they are used to control local pain caused by needling, placement of orthodontic bands, the vomiting reflex, oral mucositis, and rubber-dam clamp placement. Traditional topical anesthetics contain lidocaine or benzocaine as active ingredients and are used in the form of solutions, creams, gels, and sprays. Eutectic mixtures of local anesthesia cream, a mixture of various topical anesthetics, has been reported to be more potent than other anesthetics. Recently, new products with modified ingredients and application methods have been introduced into the market. These products may be used for mild pain during periodontal treatment, such as scaling. Dentists should be aware that topical anesthetics, although rare, might induce allergic reactions or side effects as a result of an overdose. Topical anesthetics are useful aids during dental treatment, as they reduce dental phobia, especially in children, by mitigating discomfort and pain.
Anxiety and phobia in dental procedures are common deterrents for patients visiting the dental care unit. For these individuals, procedural sedation may aid in completion of dental treatments. In most cases, the patients are conscious during sedation, thereby allowing spontaneous ventilation. Intravenous sedation (IVS) is widely used during dental treatment to relieve patient anxiety. IVS is the most effective route of administration to achieve this goal, but it requires advanced training, more than that provided during undergraduate education. During IVS, rapid onset, repetitive drug administration, easy titration, and rapid recovery from sedation can be achieved. However, conscious sedation during IVS can result in deep sedation that can cause respiratory and cardiovascular depression. Therefore, the characteristics of intravenous sedatives should be known. The purpose of this review is to discuss the characteristics and usage of intravenous sedatives currently used for dental procedures.

**Source**

**Abstract**
Local anesthesia is administered to reduce pain during dental treatments, but may itself cause pain and contribute to increased dental fear. Computer-controlled local anesthetic delivery (CCLAD) is one the method to reduce patient pain during local anesthesia; it is a device that slowly administers anesthetics by using a computerized device to control the injection speed. This literature review aims to provide an objective assessment of the usefulness of CCLAD for controlling pain by reviewing papers published to date that have used CCLAD.

**Source**

**Abstract**
Programs provided by the Korea Association of Cardiopulmonary Resuscitation include Basic Life Support (BLS), Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), and Korean Advanced Life Support (KALS). However, programs pertinent to dental care are lacking. Since 2015, related organizations have been attempting to develop a Dental Advanced Life Support (DALS) program, which can meet the needs of the dental environment. Generally, for initial management of emergency situations, basic life support is most important. However, emergencies in young children mostly involve breathing. Therefore, physicians who treat pediatric dental patients should learn PALS. It is necessary for the physician to regularly renew
training every two years to be able to immediately implement professional skills in emergency situations. In order to manage emergency situations in the pediatric dental clinic, respiratory support is most important. Therefore, mastering professional PALS, which includes respiratory care and core cases, particularly upper airway obstruction and respiratory depression caused by a respiratory control problem, would be highly desirable for a physician who treats pediatric dental patients. Regular training and renewal training every two years is absolutely necessary to be able to immediately implement professional skills in emergency situations.

**Abstract**

**INTRODUCTION:** Despite the availability of a wide variety of pharmacological agents in the field of anesthesia, there has always been a continuous search for newer local anesthetic agents with improved efficacy, potency, and better handling properties. Dexmedetomidine, a selective alpha-2 adrenergic receptor agonist, is an emerging agent for provision of additive local anesthetic effect if used with conventional local anesthetics, which can be implicated in dentistry for performing many minor oral surgical procedures. The present paper reports a pilot study comparing clinical efficacy and potency of this newer emerging drug in combination with lignocaine.

**MATERIALS AND METHODS:** Ten patients undergoing orthodontic extraction for correction of malocclusion and other dentofacial deformities requiring orthodontic treatment were locally infiltrated with 2% lignocaine plus dexmedetomidine 1μg/ml and 2% lignocaine plus adrenaline in 1:200,000 dilution at two different appointments. The onset of action, duration of action, and pain threshold were assessed.

**RESULTS:** Onset of action was found to be faster with longer duration of action with the newer drug dexmedetomidine and lignocaine combination when compared with combination of lignocaine and adrenaline.

**CONCLUSION:** The study demonstrated that the combination of dexmedetomidine with lignocaine enhances the local anesthetic potency of lignocaine without significant systemic effects when locally injected into oral mucosa.
BACKGROUND: Local anaesthetics play a key role in reducing pain and anxiety during dental treatment. However the disadvantage of using syringe and needle technique in the maxilla, proximal to the apices of the teeth is that it is painful and also leads to collateral anaesthesia. Hence this systematic review aims to identify whether computer assisted local anaesthetic delivery system could produce predictable results similar to conventional syringe needle technique and also eliminate the disadvantages.

METHOD: Electronic databases were searched for eligible studies. A pre-tested data extraction form was created and following data were extracted from each eligible study; trial site, year, trial methods, participants, interventions and outcomes. A significant heterogeneity was seen in between the eligible studies.

RESULTS: Six studies met the inclusion criteria and were included in the present review. One was cross-over and one split mouth, while others were parallel. Only one was open label and the rest were single blinded. Three studies were conducted in children while the rest in adults. The outcome measurement was directed to measure psychological attributes using visual analog scale, electric pulp testing and pain behaviour code.

CONCLUSION: Unfortunately because of the clinical heterogeneity, meta-analysis could not be performed. Hence it is difficult to conclude that the computer assisted delivery is better than the conventional method, although it was found to perform better. Many high quality studies assessing the efficacy and cost-efficiency of various modes of administration are required to confirm the utility of computer assisted delivery systems.

Abstract

In this study, we aimed to reduce PAIs through execution of a quality improvement program.

RESULTS: The overall incidence of dental injury related to anesthesia was 0.059% (38/64,718 patients). During the baseline period, the dental injury rate was 0.108% (26/24,137 patients), and it decreased from 0.051% in the initiative period (10/19,711 patients) to 0.009% in the execution period (2/20,870 patients) during implementation of the quality improvement program. Most dental injuries were associated with laryngeal mask airway (42.1%) and laryngoscopy (28.9%). The most commonly involved teeth were the upper incisors.

CONCLUSION: Perioperative dental injury (PDI) is a common adverse event associated with anesthesia that can easily lead to medicolegal litigation. A quality improvement program was conducted with the electronic, standardized dental chart to document dentition before anesthesia and dentist consultation when necessary. This study aimed to reduce PDIs through execution of a quality improvement program.

METHODS: We reviewed the 42-month interval anesthetic records of 64,718 patients who underwent anesthesia. A standardized electronic dental chart was designed to identify any dental prosthetics, fixed and removable dentures, and degree of loose teeth. The incidence of dental injuries associated with anesthesia was separated into three time periods: baseline, initiative (Phase I), and execution (Phase II). Primary outcome measurement was the incidence of PDIs related to anesthesia.

RESULTS: The overall incidence of dental injury related to anesthesia was 0.059% (38/64,718 patients). During the baseline period, the dental injury rate was 0.108% (26/24,137 patients), and it decreased from 0.051% in the initiative period (10/19,711 patients) to 0.009% in the execution period (2/20,870 patients) during implementation of the quality improvement program. Most dental injuries were associated with laryngeal mask airway (42.1%) and laryngoscopy (28.9%). The most commonly involved teeth were the upper incisors.

CONCLUSION: Dental injury incidence was significantly reduced and remained at low levels after implementation of the quality improvement program. We suggest the implementation of a standardized dental examination into the preoperative evaluation system adding pathologic teeth fixed or protected devices to minimize dental injury associated with anesthesia.
OBJECTIVE: The main objective of this systematic literature review is to identify the safest and most effective sedative drugs so as to ensure successful sedation with as few complications as possible.

STUDY DESIGN: A systematic literature review of the PubMed MEDLINE database was carried out using the key words "conscious sedation," "drugs," and "dentistry." A total of 1,827 scientific articles were found, and these were narrowed down to 473 articles after applying inclusion and exclusion criteria. These 473 studies were then individually assessed for their suitability for inclusion in this literature review.

RESULTS: A total of 21 studies were selected due to their rigorous study design and conduciveness to further, more exhaustive analysis. The selected studies included a total of 1,0003 patients classified as ASA I or II. Midazolam was the drug most frequently used for successful sedation in dental surgical procedures. Ketamine also proved very useful when administered intranasally, although some side effects were observed when delivered via other routes of administration. Both propofol and nitrous oxide (N2O) are also effective sedative drugs.

CONCLUSIONS: Midazolam is the drug most commonly used to induce moderate sedation in dental surgical procedures, and it is also very safe. Other sedative drugs like ketamine, dexmedetomidine and propofol have also been proven safe and effective; however, further comparative clinical studies are needed to better demonstrate which of these are the safest and most effective.
RESULTS: Twenty studies were included. The most commonly used sedatives were midazolam, followed by ketamine and sufentanil. Onset of action for IN midazolam was 5-15 minutes (min), however, IN ketamine was faster (mean 5.74 min), while both IN sufentanil (mean 20 min) and IN dexmedetomidine (mean 25 min) were slow in comparison. Midazolam was effective for modifying behavior in mild to moderately anxious children, however, for more invasive or prolonged procedures, stronger sedatives, such as IN ketamine, IN sufentanil were recommended. In addition, ketamine fared better in overall success rate (89%) when compared with IN midazolam (69%). Intranasal dexmedetomidine was only used as pre-medication amongst children. While its’ onset of action is longer when compared with IN midazolam, it produced deeper sedation at the time of separation from the parent and at the time of anesthesia induction.

CONCLUSION: Intranasal midazolam, ketamine, and sufentanil are effective and safe for conscious sedation, while intranasal midazolam, dexmedetomidine, and sufentanil have proven to be effective premedications.

INTRODUCTION: Many Canadian children are affected by early childhood caries (ECC) and require treatment under general anesthesia. The purpose of this study was to determine the burden of day surgery for children with ECC in Canada.

METHODS: Day surgery abstracts for children 6 years of age with ECC were extracted from the Canadian Institute for Health Information Discharge Abstract Database and National Ambulatory Care Reporting System for 4 years, 2010/11 to 2013/14. All provinces and territories participated except Quebec. Variables considered included sex, age, proportion of immigrants in the neighbourhood, Aboriginal concentration, material deprivation index and rurality. Rates were calculated for the pooled 4-year cohort.

RESULTS: The overall rate of dental surgery to treat ECC was 12.1 per 1000 children 12-59 months of age, accounting for 31.0% of all day surgeries performed on this age group in Canada. Rates of dental surgery for children from neighbourhoods with a high proportion of Aboriginal people were 7.8 times those for children living in areas with a low proportion (84.5 vs. 10.9 per 1000). For children from rural regions of Canada, rates were 3.2 times those of urban dwelling children (31.2 vs. 9.8 per 1000). Children from the least-affluent regions had dental surgery rates 3.7 times higher than those from the most-affluent communities (25.7 vs. 6.9 per 1000). Total hospital-associated costs of treating ECC under general anesthesia averaged $21184545 annually.

CONCLUSION: Dental surgery for ECC is far too common and occurs more often among children from the least-affluent households, rural regions and communities with a high proportion of Aboriginal people. Dental surgery rates can serve as an important population health indicator.
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Title: The efficacy of eutectic mixture of local anesthetics as a topical anesthetic agent used for dental procedures: A brief review.


Abstract: Dental pain management is one of the most critical aspects of modern dentistry which might affect patient's quality of life. Several methods are suggested to provide a painless situation for patients. Desensitization of the oral site using topical anesthetic agents is one of those methods. The improvements of topical anesthetic agents are probably one of the most important advances in dental science in the past 100 years. Most of them are safe and can be applied on oral mucosa with minimal irritation and allergic reactions. At present, these agents are various with different potent and indications. Eutectic mixture of local anesthetics (EMLA) (lidocaine + prilocaine) is a commercial anesthetic agent which has got acceptance among dental clinicians. This article provides a brief review about the efficacy of EMLA as a topical anesthetic agent when used during dental procedures.

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Yiu, Cynthia K Y. Department of Paediatric Dentistry and Orthodontics, Faculty of Dentistry, University of Hong Kong, Hong Kong, China.

Title: Dental treatment under general anesthesia for special-needs patients: analysis of the literature. [Review]


Abstract: The aim of the present review was to identify the studies published on dental treatment under general anesthesia for special-needs patients. A comprehensive search of the reported literature from January 1966 to May 2012 was conducted using PubMed, Medline, and Embase. Keywords used in the search were "dental treatment under general anesthesia", "special-needs patients", "medically-compromised patients", and "children", in various combinations. Studies published only on dental treatment under general anesthesia and in English were included. Only 10 studies were available for final analysis. Age range from 1 to 50 years, and restorative procedures, were most prevalent. Only two studies discussed repeated general anesthesia, with rates of 7.2% and 10.2%. Over time, the provision of general anesthesia for special-needs patients has changed from dental clinics to general hospitals. The demand for dental treatment for special-needs patients under general anesthesia continues to increase. Currently, there are no certain accepted protocols for the provision of dental treatment under general anesthesia.

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Title
A Systematic Review of the Cervical Plexus Accessory Innervation and Its Role in Dental Anesthesia. [Review]

Source

Abstract
INTRODUCTION: Accessory innervation (AI) may account for the persistent sensation perceived after successful mandibular anesthesia in the adult patient. The purpose of this systematic review was to record the quality of evidence pertaining to the cervical plexus (CP) AI in dental anesthesia.

MATERIALS AND METHODS: Electronic and manual searches were conducted using Ovid and Medline of articles published from 1922 to March of 2015. Studies written in any language were included as long as they involved: (i) humans, animals, and/or cadavers AND (ii) anatomical and/or research anesthetic-technique approaches and/or clinical approaches. Exclusion criteria were (i) maxillary buccal infiltration, (ii) no abstract/paper available, (iii) studies that do not comprise the description of the branches of the CP branches in dentistry and (iv) duplicated articles. The articles were reviewed and graded by levels of evidence (LOE) through a methodological scoring index (MSI).

RESULTS: Forty-four out of 185 papers fulfilled the inclusion criteria. One randomized control trial, 3 comprehensive reviews, 1 cohort study, 5 case series/reports, 16 poor-quality cohort and case series/reports and 18 reviews/case, reports/expert opinions were found. Of the 44 publications, there were 4 LOE 1, 1 LOE 2, 5 LOE 3, 20 LOE 4 and 14 LOE 5 studies.

CONCLUSIONS: The MSI helped to classify papers LOE in a standardized and objective approach. The objective evidence quality occurrence recorded was found to be LOE 4 (n = 20) > LOE 5 (n = 14) > LOE 3 (n = 5) > LOE 1 (n = 4) > LOE 2 (n = 1). The anatomy of the CP needs to be reexamined and understood in the anatomical literature.

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Title
Pain and anxiety management for pediatric dental procedures using various combinations of sedative drugs: A review. [Review]

Source

Abstract
For fearful and uncooperative children behavioral management techniques are used. In order to control the pain and anxiety in pedodontic patients, pharmacologic sedation, anesthesia and analgesia are commonly used. Midazolam is commonly used as an oral sedation agent in children; it has several features such as safety of use, quick onset and certain degree of amnesia that makes it a desirable sedation agent in children. This review paper discusses various aspects of oral midazolam, ketamine and their combinations in conscious sedation including, advantages of oral route of sedation, pharmacokinetics, range of oral doses, and antagonists for clinical dental treatment procedures.

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RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

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Title
Pain and anxiety management for pediatric dental procedures using various combinations of sedative drugs: A review. [Review]

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Abstract
For fearful and uncooperative children behavioral management techniques are used. In order to control the pain and anxiety in pedodontic patients, pharmacologic sedation, anesthesia and analgesia are commonly used. Midazolam is commonly used as an oral sedation agent in children; it has several features such as safety of use, quick onset and certain degree of amnesia that makes it a desirable sedation agent in children. This review paper discusses various aspects of oral midazolam, ketamine and their combinations in conscious sedation including, advantages of oral route of sedation, pharmacokinetics, range of oral doses, and antagonists for clinical dental treatment procedures.
RECENT REVIEWS RELATED TO DENTAL ANAESTHESIA/SEDATION

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Title
Different Aspects of General Anesthesia in Pediatric Dentistry: A Review. [Review]

Source

Abstract
CONTEXT: Most child population is able to undergo dental treatment in the conventional setting. However, some children fail to cope with in-office conscious state and cannot respond to usual management modalities. This review aims to discuss the topic further.

EVIDENCE ACQUISITION: A computerized search in databases PubMed, MEDLINE, EMBASE, Google Scholar and Google were performed using dental general anesthesia related keywords. Original and review English-written articles that were limited to child population were retrieved without any limitation of publication date. The suitable papers were selected and carefully studied. A data form designed by author was used to write relevant findings.

RESULTS: Preoperative oral examination and comprehensive evaluation of treatment needs is only possible after clinical and radiographic oral examination. Effective collaboration in dental GA team should be made to minimize psychological trauma of children who undergo dental GA. Before conducting comprehensive dental treatment under GA, the general health of the child and the success rate of procedures provided needs to be accurately evaluated. It is noteworthy that determination of the optimal timing for GA dental operation is of great importance. Providing safety with pediatric dental rehabilitation under GA is critical.

CONCLUSIONS: Besides criteria for case selection of dental GA, some degree of dental practitioner's judgment is required to make decision. Pre- and post-operative instructions to parents or caregiver decrease the risk of complications. However, trained resuscitation providers, careful monitoring and advanced equipment minimize adverse outcomes.

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Title
Intra-pocket anaesthesia and pain during probing, scaling and root planing: a systematic review and meta-analysis. [Review]

Source

Local Messages
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Abstract
AIM: A systematic review/meta-analysis was performed to evaluate pain during probing, scaling and root planing using intra-pocket anaesthesia versus placebo in adult patients.

METHODS: A search was performed in PubMed, Scopus, Web of Science, Latin American and Caribbean Health Sciences Literature database, Brazilian Library in Dentistry, Cochrane Library and Grey literature. IADR abstracts, unpublished trials registries, dissertations and theses were also searched for randomized clinical trials comparing the clinical effectiveness of intra-pocket anaesthesia and placebo. Risk/intensity of pain was the primary outcome. The risk of bias tool from the Cochrane Collaboration was used for quality assessment. Meta-analysis was performed on studies considered at low risk of bias.

RESULTS: A total of 1740 articles were identified. Eleven remained in the qualitative synthesis, and nine studies were considered at "low" risk of bias for meta-analysis. Standardized Hedge's g mean difference for pain intensity using visual analogue scale and Heft-Parker pain scales was -0.576 (95% confidence interval [CI] -0.94 to -0.22; p = 0.002) and for verbal rating scale
pain scale it was -1.814 (95% CI -3.38 to -0.245; p = 0.023). The odds ratio for the risk of pain was 0.025 (95% CI 0.003 to 0.25; p = 0.002) and the odds ratio for the need for rescue anaesthesia it was 0.358 (95% CI 0.174 to 0.736; p = 0.005).

CONCLUSIONS: The anaesthetic gel decreases the risk and intensity of pain during probing/SRP.
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Title
A brief review on the efficacy of different possible and nonpharmacological techniques in eliminating discomfort of local anesthesia injection during dental procedures. [Review]

Source
Albang Maqalat Wa Abhat Fi Altahdir Waalinas. 10(1):13-6, 2016 Jan-Apr.

Abstract
Dental anxiety and fear of needle injection is one of the most common problems encountered by dental practitioners, especially in the pediatric patient. In consequence, it might affect the patient’s quality of life. Several methods are suggested to lower the discomfort of local anesthesia injection during dental procedures. Desensitization of injection site is one of the recommended strategies. Among chemical anesthetic topical agents that are effective but might have allergic side effects, using some nonpharmacological and safe techniques might be useful. This study aimed to overview the efficacy of using cooling techniques, mostly by ice or popsicles, warming or pH buffering of drug, and using modern devices to diminish the discomfort of local anesthesia injection during dental procedures.

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Title
Irreversible pulpitis and achieving profound anesthesia: Complexities and managements. [Review]

Source
Albang Maqalat Wa Abhat Fi Altahdir Waalinas. 10(1):3-6, 2016 Jan-Apr.

Abstract
Dental pain management is one of the most critical aspects of modern dentistry. Irreversible pulpitis and further root canal therapy might cause an untolerated pain to the patients. The improvements in anesthetic agents and techniques were one of the advantages of studying nerve biology and stimulation. This article tried to overview of the nerve activities in inflammatory environments or induced pain. Furthermore, the proper advises, and supplementary techniques were reviewed for better pain management of irreversible pulpitis.

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Institution
Title: Role of intraseptal anesthesia for pain-free dental treatment. [Review]


Abstract: Pain control during the dental procedure is essentials and challenging. A complete efficacious pulp anesthesia has not been attained yet. The regional anesthesia such as inferior alveolar nerve block (IANB) only does not guarantee the effective anesthesia with patients suffering from irreversible pulpitis. This main aim of this review was to discuss various aspects of intraseptal dental anesthesia and its role significance in pain-free treatment in the dental office. In addition, reasons of failure and limitations of this technique have been highlighted. Literature search was conducted for peer-reviewed articles published in English language in last 30 years. Search words such as dental anesthesia, pain control, intraseptal, and nerve block were entered using a web of knowledge and Google scholar databases. Various dental local anesthesia techniques were reviewed. A combination of block anesthesia, buccal infiltration and intraligamentary injection resulted in deep anesthesia (P = 0.003), and higher success rate compared to IANB. For pain-free management of conditions such as irreversible pulpitis, buccal infiltration (4% articaine), and intraosseous injection (2% lidocaine) are better than intraligamentary and IANB injections. Similarly, nerve block is not always effective for pain-free root canal treatment hence, needing supplemental anesthesia. Intraseptal anesthesia is an efficient and effective technique that can be used in maxillary and mandibular adult dentition. This technique is also beneficial when used in conjunction to the regional block or local dental anesthesia.
drug interactions, appropriate training and skills in airway management to allow rescue of the patient, age- and size-appropriate equipment for airway management and venous access, appropriate medications and reversal agents, sufficient numbers of staff to both carry out the procedure and monitor the patient, appropriate physiologic monitoring during and after the procedure, a properly equipped and staffed recovery area, recovery to the presedation level of consciousness before discharge from medical/dental supervision, and appropriate discharge instructions. This report was developed through a collaborative effort of the American Academy of Pediatrics and the American Academy of Pediatric Dentistry to offer pediatric providers updated information and guidance in delivering safe sedation to children.

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Authors
Anonymous.

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Guideline on Use of Nitrous Oxide for Pediatric Dental Patients.

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Guideline on Use of Local Anesthesia for Pediatric Dental Patients.

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Mohan, Naveen. Department of Dentistry/Oral and Maxillofacial Surgery, The Brooklyn Hospital Center, 121 DeKalb Avenue, Box 187, Brooklyn, NY 11201, USA.
Updates of Topical and Local Anesthesia Agents. [Review]

Source

Abstract
As described in this article, there are many advances in topical and local anesthesia. Topical and local anesthetics have played a great role in dentistry in alleviating the fears of patients, eliminating pain, and providing pain control. Many invasive procedures would not be performed without the use and advances of topical/local anesthetics. The modern-day dentist has the responsibility of knowing the variety of products on the market and should have at least references to access before, during, and after treatment. This practice ensures proper care with topical and local anesthetics for the masses of patients entering dental offices worldwide.

Conscious Intravenous Sedation in Dentistry: A Review of Current Therapy. [Review]

Source

Abstract
Several sedation options are used to minimize pain, anxiety, and discomfort during oral surgery procedures. Minimizing or eliminating pain and anxiety for dental care is the primary goal for conscious sedation. Intravenous conscious sedation is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate as well as cardiovascular function. Patients must retain their protective airway reflexes, and respond to and understand verbal communication. The drugs and techniques used must therefore carry a broad margin of safety.
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Title
Oral Sedation in the Dental Office. [Review]

Source

Local Messages
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Abstract
This article highlights the commonly used medications used in dentistry and oral surgery. General dentists and specialists must be knowledgeable about the pharmacology of the drugs currently available along with their risks and benefits. Enteral sedation is a useful adjunct for the treatment of anxious adult and pediatric patients. When enteral sedation is used within the standards of care, the interests of the public and the dental profession are served through a cost-effective, effective service that can be widely available. Oral sedation enables dentists to provide dental care to millions of individuals who otherwise would have unmet dental needs.

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Title

Source

Abstract
The safe sedation of children for procedures requires a systematic approach that includes the following: no administration of sedating medication without the safety net of medical/dental supervision, careful presedation evaluation for underlying medical or surgical conditions that would place the child at increased risk from sedating medications, appropriate fasting for elective procedures and a balance between the depth of sedation and risk for those who are unable to fast because of the urgent nature of the procedure, a focused airway examination for large (kissing) tonsils or anatomic airway abnormalities that might increase the potential for airway obstruction, a clear understanding of the medication's pharmacokinetic and pharmacodynamic effects and drug interactions, appropriate training and skills in airway management to allow rescue of the patient, age- and size-appropriate equipment for airway management and venous access, appropriate medications and reversal agents, sufficient numbers of staff to both carry out the procedure and monitor the patient, appropriate physiologic monitoring during and after the procedure, a properly equipped and staffed recovery area, recovery to the presedation level of consciousness before discharge from medical/dental supervision, and appropriate discharge instructions. This report was developed through a collaborative effort of the American Academy of Pediatrics and the American Academy of Pediatric Dentistry to offer pediatric providers updated information and guidance in delivering safe sedation to children.

Copyright © 2016 American Academy of Pediatric Dentistry and American Academy of Pediatrics. This report is being published concurrently in Pediatric Dentistry July 2016. The articles are identical. Either citation can be used when citing this report.

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Institution
The increasing prevalence of diabetes mellitus in the general population has many implications for the ambulatory anesthesia provider. Complications, particularly associated with poor glycemic control, can affect multiple organ systems and jeopardize the safety of any planned anesthetic. It is essential that anesthesiologists and sedation providers have in-depth knowledge of the pathophysiology of diabetes mellitus and the comorbid conditions that commonly accompany it. Anesthesiologists and sedation providers must also understand certain surgical and anesthetic considerations when planning an effective and safe anesthetic for diabetic patients. This is a 2-part series concerning perioperative glycemic control for patients with diabetes mellitus. Part 1 will focus on the physiology of diabetes and its associated disease states. Part 2 will address the pharmacology associated with the wide variety of medications used to treat the disorder and the most recent guidelines for blood glucose management in ambulatory surgical patients.

PURPOSE: The purpose of this study was to determine if American Association of Oral and Maxillofacial Surgeons members who practice in the United States practice American Association of Oral and Maxillofacial Surgeons (ASA) nil per os (NPO) guidelines into their preoperative instructions.

MATERIALS AND METHODS: We designed and implemented a cross-sectional study and enrolled a random sample of private-practice American Association of Oral and Maxillofacial Surgeons members who practice in the United States. The predictor variables were year of graduation from residency, dual degree (MD and DDS or DMD) or single degree, and region. The primary outcome variable was adoption of the ASA NPO guidelines, defined as recommending fasting times of 2 hours for clear liquids and 6 hours for solid foods. To collect data, a systematic online search was implemented. Appropriate univariate and bivariate statistics were computed, and the level of significance was set at .05; in addition, 95% confidence intervals were calculated.

RESULTS: The study sample was composed of 431 oral and maxillofacial surgeons (OMSs). Almost all of the study sample (99.1%) did not adopt the ASA guidelines. The fasting recommendations were different from 2 hours for clear liquids and 6 hours for solid foods. However, recommendations of 2 hours or greater for clear liquids were made by 99.8% of OMSs, and recommendations of 6 hours or greater for solid foods were made by 99.3%. Only 4.4% of OMSs made different recommendations for clear liquids and solid foods. No substantial association was found between whether OMSs adopted the most current ASA guidelines and the year they graduated from residency or the obtainment of dual degrees.
CONCLUSIONS: OMSs in private practice are overwhelmingly recommending longer fasting times for clear liquids and solid foods on their Web sites when compared with the current ASA guidelines before ambulatory anesthesia. The ASA guidelines are based on meta-analysis; therefore, deviations in practice, although not incorrect, may call for discussion.

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Title
Articaine buccal infiltration vs lidocaine inferior dental block - a review of the literature. [Review]
Source
Abstract
AIM: This paper aims to compare the effectiveness of articaine buccal infiltrations (BIs) and lidocaine inferior alveolar nerve blocks (IANBs) for inducing pulpal anaesthesia in mandibular molars.

METHOD: Studies which compared articaine BIs with lidocaine IANBs were identified by completing a full literature search using the MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials databases. Only studies that used permanent mandibular molars were included. Two papers were accepted for appraisal.

RESULTS: It was found that 55.6-69.2% and 65.4-70.4% of lidocaine IANBs and articaine BIs were successful, respectively. Neither study was able to determine a significant difference between the two techniques.
CONCLUSIONS: Articaine BIs are no more effective than lidocaine IANBs and the decision of which method to practice should be based on patient selection, cost and time efficiency. The studies present a number of weaknesses in their design, hence, the level of evidence they provide is inconclusive. Further investigation in this field is warranted.

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Title
Alleged malpractice in anesthesiology: analysis of a series of private insurance claims.
Comments
Comment in: Minerva Anestesiol. 2016 Feb;82(2):154-6; PMID: 26449778
Source
Abstract
BACKGROUND: Medical malpractice is currently a crucial topic and anesthesia is a key specialty for the improvement of patient safety. However, death and permanent impairment due to anesthesia still occur and studies of insurance analysis data are increasing. We investigated the main features of a major Italian insurance broker's archive in order to identify possible recurrent pitfalls in this critical field of medicine.

METHODS: Three hundred seventeen Italian claims were analyzed, filling out a standardized form that recorded information on patient and physician's characteristics, procedures, sequence and location of events and outcomes. The operative setting, the type of anesthesia performed the origin of the multidisciplinary team malpractice hypothesis, the final clinical outcome and the malpractice investigation results were also analyzed.

RESULTS: In 225 malpractice claims, the adverse event was surgery-linked, either intraoperatively (114 cases) or postoperatively (111 cases): abdominal surgery (26%), orthopedics (22%), gynecology (20%), heart surgery (11%) and neurosurgery (9.5%) were the most frequently involved surgical specialties. In 92 cases, the claim was unlinked to a surgeon's activity, with dental damage in oral intubation procedures as the greatest contributor (42.3%). Anesthetists' malpractice was technically ascertained in 39% of cases, 74.8% resulting in permanent impairment.

CONCLUSIONS: Malpractice was mainly suspected in surgery-linked procedures. Most of the claims were settled for procedural error in performing locoregional anesthesia and oral intubation procedures. 60% of all closed claims resulted in no malpractice ascertained. Confirmed malpractice typically deals with non surgery-linked and non multidisciplinary team cases, causing permanent impairment.

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Title
Ophthalmologic complications after administration of local anesthesia in dentistry: a systematic review. [Review]
Source
OBJECTIVE: The aim of this review was to investigate the association between the occurrence of ocular adverse events and dental local anesthesia, the most plausible anatomic mechanisms, and the measures that offer patients a restitutio ad integrum.

STUDY DESIGN: This systematic review adopted a structured protocol to access available publications and followed the PRISMA statement.

RESULTS: Eighty-nine cases of patients experiencing ocular adverse events after administration of dental local anesthesia have been reported in the literature. Most of the complications manifested as double vision. Only 8% of the complications caused permanent functional damage, either as vision deficit or anisocoria. Complete permanent blindness was not reported.

CONCLUSIONS: Ocular complications as a result of dental local anesthesia may be seen as rare occurrences with usually low intensity. However, visual function may become permanently impaired and serious medical conditions may obscure ocular dysfunction.
BACKGROUND: Midazolam is used for sedation before diagnostic and therapeutic medical procedures. It is an imidazole benzodiazepine that has depressant effects on the central nervous system (CNS) with rapid onset of action and few adverse effects. The drug can be administered by several routes including oral, intravenous, intranasal and intramuscular.

OBJECTIVES: To determine the evidence on the effectiveness of midazolam for sedation when administered before a procedure (diagnostic or therapeutic).

SEARCH METHODS: We searched the Cochrane Central Register of Controlled Trials (CENTRAL to January 2016), MEDLINE in Ovid (1966 to January 2016) and Ovid EMBASE (1980 to January 2016). We imposed no language restrictions.

SELECTION CRITERIA: Randomized controlled trials in which midazolam, administered to participants of any age, by any route, at any dose or any time before any procedure (apart from dental procedures), was compared with placebo or other medications including sedatives and analgesics.

DATA COLLECTION AND ANALYSIS: Two authors extracted data and assessed risk of bias for each included study. We performed a separate analysis for each different drug comparison.

MAIN RESULTS: We included 30 trials (2319 participants) of midazolam for gastrointestinal endoscopy (16 trials), bronchoscopy (3), diagnostic imaging (5), cardioversion (1), minor plastic surgery (1), lumbar puncture (1), sutureting (2) and Kirschner wire removal (1). Comparisons were: intravenous diazepam (14), placebo (5) etomidate (1) fentanyl (1), flunitrazepam (1) and propofol (1); oral chloral hydrate (4), diazepam (2), diazepam and clonidine (1); ketamine (1) and placebo (3); and intranasal placebo (2). There was a high risk of bias due to inadequate reporting about randomization (75% of trials). Effect estimates were imprecise due to small sample sizes. None of the trials reported on allergic or anaphylactoid reactions. Intravenous midazolam versus diazepam (14 trials; 1069 participants) There was no difference in anxiety (risk ratio (RR) 0.80, 95% confidence interval (CI) 0.39 to 1.62; 175 participants; 2 trials) or discomfort/pain (RR 0.60, 95% CI 0.24 to 1.49; 415 participants; 5 trials; I2 = 67%). Midazolam produced greater anterograde amnesia (RR 0.45; 95% CI 0.30 to 0.66; 587 participants; 9 trials; low-quality evidence). Intravenous midazolam versus placebo (5 trials; 493 participants) One trial reported that fewer participants who received midazolam were anxious (3/47 versus 15/35; low-quality evidence). There was no difference in discomfort/pain identified in a further trial (3/85 in midazolam group; 4/82 in placebo group; P = 0.876; very low-quality evidence). Oral midazolam versus chloral hydrate (4 trials; 268 participants) Midazolam increased the risk of incomplete procedures (RR 4.01; 95% CI 1.92 to 8.40; moderate-quality evidence). Oral midazolam versus placebo (3 trials; 176 participants) Midazolam reduced pain (midazolam mean 2.56 (standard deviation (SD) 0.49); placebo mean 4.82 (SD 1.49); P < 0.005) and anxiety (midazolam mean 1.52 (SD 0.3); placebo mean 3.97 (SD 0.44); P < 0.0001) in one trial with 99 participants. Two other trials did not find a difference in numerical rating of anxiety (mean 1.7 (SD 2.4) for 20 participants randomized to midazolam; mean 2.6 (SD 2.9) for 22 participants randomized to placebo; P = 0.216; mean Spielberger's Trait Anxiety Inventory score 47.56 (SD 11.68) in the midazolam group; mean 52.78 (SD 9.61) in placebo group; P > 0.05). Intranasal midazolam versus placebo (2 trials; 149 participants) Midazolam induced sedation (midazolam mean 3.15 (SD 0.36); placebo mean 2.56 (SD 0.64); P < 0.001) and reduced the numerical rating of anxiety in one trial with 54 participants (midazolam mean 17.3 (SD 18.58); placebo mean 49.3 (SD 29.46); P < 0.001). There was no difference in meta-analysis of results from both trials for risk of incomplete procedures (RR 0.14, 95% CI 0.02 to 1.12; downgraded to low-quality evidence).

AUTHORS' CONCLUSIONS: We found no high-quality evidence to determine if midazolam, when administered as the sole sedative agent prior to a procedure, produces more or less effective sedation than placebo or other medications. There is low-quality evidence that intravenous midazolam reduced anxiety when compared with placebo. There is inconsistent evidence that oral midazolam decreased anxiety during procedures compared with placebo. Intranasal midazolam did not reduce the risk of incomplete procedures, although anxiety and sedation were observed. There is moderate-quality evidence suggesting that oral midazolam produces less effective sedation than chloral hydrate for completion of procedures for children undergoing non-invasive diagnostic procedures.

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Title
A review of daycase GA services for Special Care patients at University Hospital, Bristol.

Source

Local Messages
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Abstract
This paper describes and discusses a review of adult special care dentistry day cases in a UK hospital over a two year period and makes recommendations for other such reviews and for practice. Dental public health competencies illustrated: oral health needs assessment and evaluation of dental health services.
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Authors
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Title
Articaine--to use or not to use?. [Review]
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SAAD Digest. 32:50-4, 2016 Jan.
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:
Abstract
AIMS: To review the literature, to investigate whether there was a consensus on what encompasses over-sedation, and to
determine the guidance employed for the administration of flumazenil.
METHODS: A literature search was performed following which a self-designed questionnaire was emailed to 14 sedation leads
within UK Dental Hospitals.
RESULTS: 10 documents in the literature review met the inclusion criteria. In their definitions of over-sedation, loss of
consciousness and respiratory depression were the main terms used; but a variety of terms were also seen, indicating a lack of
agreement. Fourteen dental institutes were contacted of which nine (64%) responded. Thirty-seven percent of sedation leads who
responded stated they were unaware of a definition for over-sedation. Seventy-seven percent stated that when flumazenil was
used this was recorded in a drugs book, with a broad range of justifications given.
CONCLUSION: This study shows that there is a lack of uniformity both from clinicians and the literature, in what encompasses
over-sedation. This makes formulating an accepted definition of over-sedation difficult. In order to ensure accurate reporting,
monitoring and auditing of such events, a clear definition for over-sedation is required and can be used to provide clarity when
flumazenil is to be administered.

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Unique Identifier
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Title
Defining Over-Sedation: Literature Review and National Survey of Dental Hospitals Within the United Kingdom. [Review]
Source
SAAD Digest. 32:28-33, 2016 Jan.
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:
Abstract
AIMS: To review the literature, to investigate whether there was a consensus on what encompasses over-sedation, and to
determine the guidance employed for the administration of flumazenil.
METHODS: A literature search was performed following which a self-designed questionnaire was emailed to 14 sedation leads
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agreement. Fourteen dental institutes were contacted of which nine (64%) responded. Thirty-seven percent of sedation leads who
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CONCLUSION: This study shows that there is a lack of uniformity both from clinicians and the literature, in what encompasses
over-sedation. This makes formulating an accepted definition of over-sedation difficult. In order to ensure accurate reporting,
monitoring and auditing of such events, a clear definition for over-sedation is required and can be used to provide clarity when
flumazenil is to be administered.

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Status
MEDLINE
BACKGROUND: Some sedatives used in children and adolescents can affect memory function. Memory impairment of traumatic experience can minimize the chance of future psychological trauma. Knowledge about the potential of different sedatives to produce amnesia can help in the decision-making process of choosing a sedative regimen. The aim of this systematic review is to evaluate the effect of different sedatives on memory of perioperative events in children and adolescents.

METHODS/DESIGN: Electronic databases and other sources, such as trial registers, gray literature, and conference abstracts will be searched. Randomized controlled trials will be included that assess memory of perioperative events in children and adolescents 2-19 years old receiving sedative drugs as premedication or as agents for procedural sedation. The outcomes will be loss of memory after and before sedative administration (anterograde and retrograde amnesia). Two independent reviewers will perform screening, study selection, and data extraction. Disagreement at all levels will be resolved by consensus or by involving a third reviewer. Assessment of the risk of bias of included studies will be performed according to "Cochrane Collaboration's Tool for Assessing Risk of Bias in Randomized Trials." Clinical and methodological heterogeneity across studies will be evaluated to determine if it is possible to combine or not combine study results in a meta-analysis.

DISCUSSION: To the best of our knowledge, there is no systematic review that specifically addresses this question. Findings from the review will be useful in the decision-making process about the best sedative for minimizing recall of the medical/dental event and possible psychological trauma.

SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42015017559.
Abstract

PURPOSE: The purpose of this study was to determine if American Association of Oral and Maxillofacial Surgeons members have integrated the current American Society of Anesthesiologists (ASA) nil per os (NPO) guidelines into their preoperative instructions.

MATERIALS AND METHODS: We designed and implemented a cross-sectional study and enrolled a random sample of private-practice American Association of Oral and Maxillofacial Surgeons members who practice in the United States. The predictor variables were year of graduation from residency, dual degree (MD and DDS or DMD) or single degree, and region. The primary outcome variable was adoption of the ASA NPO guidelines, defined as recommending fasting times of 2 hours for clear liquids and 6 hours for solid foods. To collect data, a systematic online search was implemented. Appropriate univariate and bivariate statistics were computed, and the level of significance was set at .05; in addition, 95% confidence intervals were calculated.

RESULTS: The study sample was composed of 431 oral and maxillofacial surgeons (OMSs). Almost all of the study sample (99.1%) did not adopt the ASA guidelines. The fasting recommendations were different from 2 hours for clear liquids and 6 hours for solid foods. However, recommendations of 2 hours or greater for clear liquids were made by 99.8% of OMSs, and recommendations of 6 hours or greater for solid foods were made by 99.3%. Only 4.4% of OMSs made different recommendations for clear liquids and solid foods. No substantial association was found between whether OMSs adopted the most current ASA guidelines and the year they graduated from residency or the obtainment of dual degrees.

CONCLUSIONS: OMSs in private practice are overwhelmingly recommending longer fasting times for clear liquids and solid foods on their Web sites when compared with the current ASA guidelines before ambulatory anesthesia. The ASA guidelines are based on meta-analysis; therefore, deviations in practice, although not incorrect, may call for discussion.

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Title
Hypersensitivity to local anesthetics. [Review]

Source

Abstract

Using local anaesthetics in daily practice, particularly by anaesthetists and dentists, is connected with the risk of side effects. Therefore, the observation of side effects, carrying out detailed research (according to the chart proposed in this study) and conducting specialist examinations is of the highest importance. There is a variety of side effects that could occur during local anaesthesia procedures, with the intensity ranging from clinically unimportant to life threatening. Clinicians' major concerns are the appearance of various hypersensitivity reactions, including anaphylaxis. Healthcare providers responsible for the administration of local anaesthetics should be able to detect hypersensitivity reactions to implement appropriate treatment and then choose highly selected diagnostic procedures. The final diagnosis should be based on specific medical history; documentation, including a description of the case and measurement of tryptase activity; skin tests; and provocation trials. Screening tests are not recommended in populations without hypersensitivity to local anaesthetics in their medical history.
BACKGROUND: Medical malpractice is currently a crucial topic and anesthesia is a key specialty for the improvement of patient safety. However, death and permanent impairment due to anesthesia still occur and studies of insurance analysis data are increasing. We investigated the main features of a major Italian insurance broker's archive in order to identify possible recurrent pitfalls in this critical field of medicine.

METHODS: Three hundred seventeen Italian claims were analyzed, filling out a standardized form that recorded information on patient and physician's characteristics, procedures, sequence and location of events and outcomes. The operative setting, the type of anesthesia performed the origin of the multidisciplinary team malpractice hypothesis, the final clinical outcome and the malpractice investigation results were also analyzed.

RESULTS: In 225 malpractice claims, the adverse event was surgery-linked, either intraoperatively (114 cases) or postoperatively (111 cases): abdominal surgery (26%), orthopedics (22%), gynecology (20%), heart surgery (11%) and neurosurgery (9.5%) were the most frequently involved surgical specialties. In 92 cases, the claim was unlinked to a surgeon's activity, with dental damage in oral intubation procedures as the greatest contributor (42.3%). Anesthetists' malpractice was technically ascertained in 39% of cases, 74.8% resulting in permanent impairment.

CONCLUSIONS: Malpractice was mainly suspected in surgery-linked procedures. Most of the claims were settled for procedural error in performing locoregional anesthesia and oral intubation procedures. 60% of all closed claims resulted in no malpractice ascertained. Confirmed malpractice typically deals with non surgery-linked and non multidisciplinary team cases, causing permanent impairment.

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Title
Memory effects of sedative drugs in children and adolescents--protocol for a systematic review. [Review]

Source
Systematic Reviews. 5:34, 2016 Feb 18.

Abstract
BACKGROUND: Some sedatives used in children and adolescents can affect memory function. Memory impairment of traumatic experience can minimize the chance of future psychological trauma. Knowledge about the potential of different sedatives to produce amnesia can help in the decision-making process of choosing a sedative regimen. The aim of this systematic review is to evaluate the effect of different sedatives on memory of perioperative events in children and adolescents.
METHODS/DESIGN: Electronic databases and other sources, such as trial registers, gray literature, and conference abstracts will be searched. Randomized controlled trials will be included that assess memory of perioperative events in children and adolescents 2-19 years old receiving sedative drugs as premedication or as agents for procedural sedation in a medical or dental settings. The outcomes will be loss of memory after and before sedative administration (anterograde and retrograde amnesia). Two independent reviewers will perform screening, study selection, and data extraction. Disagreement at all levels will be resolved by consensus or by involving a third reviewer. Assessment of the risk of bias of included studies will be performed according to "Cochrane Collaboration's Tool for Assessing Risk of Bias in Randomized Trials." Clinical and methodological heterogeneity across studies will be evaluated to determine if it is possible to combine or not combine study results in a meta-analysis.

DISCUSSION: To the best of our knowledge, there is no systematic review that specifically addresses this question. Findings from the review will be useful in the decision-making process about the best sedative for minimizing recall of the medical/dental event and possible psychological trauma.

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Status
PubMed-not-MEDLINE
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Title
Considerations for submucosal midazolam administration in combination with oral and inhaled medications for sedation of pediatric dental patients. [Review]
Source
Abstract
Sedation allows patients to maintain their airway independently and respond appropriately to physical stimulation and verbal command while maintaining a minimum depressed level of consciousness. Drugs commonly used for sedation of pediatric dental patients include a combination of chloral hydrate, hydroxyzine, and nitrous oxide-oxygen. Midazolam is a benzodiazepine and currently one of the most commonly used intravenous sedative agents. It can be easily titrated to provide a wide range of sedation, from conscious sedation to deep sedation, and exhibits a wide safety margin without severe respiratory and circulatory depression. At an appropriate dose, it also decreases patient anxiety and induces amnesia. We found that the submucosal administration of midazolam combined with chloral hydrate provided increased sedative effects and decreased the postoperative vomiting response compared with conventional chloral hydrate administration, with no significant difference in physiological responses. The depth of sedation can be titrated using this technique.

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Ryu, Dae-Seung. Department of Oral and Maxillofacial surgery, Kyung Hee University Dental Hospital at Gangdong, Kyung Hee University, Korea.
Title
The alternative of oral sedation for pediatric dental care. [Review]
Source

Abstract

In pediatric dentistry, chloral hydrate is habitually selected for sedation of uncooperative children. Although chloral hydrate has been used for decades, various adverse effects are reported and necessity for new alternative drugs has increased. Dexmedetomidine was approved by FDA for sedation at intensive care units (ICU) in 1999. Compared to conventional sedative drugs, dexmedetomidine has not only analgesic and sedative effects but also it barely suppresses the respiratory system. Due to these characteristics, dexmedetomidine is known as safe sedative drug for children and elderly patients. Furthermore, approved by KFDA in 2010 in Korea, the frequency of sedation using dexmedetomidine is increasing. However, due to its intravenous administration method, it was difficult to apply in pediatric dentistry. Recently, intranasal administration method was introduced which might be a new possible alternative of oral sedation. In this study, we compare the mechanisms, pros and cons of chloral hydrate and dexmedetomidine, introducing new possibilities.

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Journal Article. Review.

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Authors
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Laub, Donald R Jr; Williams, Robert K.

Title
Neonatal Anesthesia Neurotoxicity: A Review for Cleft and Craniofacial Surgeons.

Source

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Abstract

There is growing evidence that the commonly used anesthetic agents cause some degree of damage to the early developing brain. The animal evidence for anesthetic neurotoxicity is compelling. Numerous confounders in human research prevent researchers from drawing definitive conclusions about the degree of risk. For every surgery, it should be assessed whether the benefits of an early surgical procedure justify a potential but unquantifiable risk of neurotoxicity of anesthetic agents. The timing and number of surgeries in our treatment protocols may need to be reevaluated to account for these potential risks.

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Title
Topical anesthesia. [Review]

Source

Abstract

Topical anesthetics are being widely used in numerous medical and surgical sub-specialties such as anesthesia, ophthalmology, dermatology, dentistry, urology, and aesthetic surgery. They cause superficial loss of pain sensation after direct application. Their delivery and effectiveness can be enhanced by using free bases; by increasing the drug concentration, lowering the melting point; by using physical and chemical permeation enhancers and lipid delivery vesicles. Various topical anesthetic agents available for use are eutectic mixture of local anesthetics, ELA-max, lidocaine, epinephrine, tetracaine, bupivacain, 4% tetracaine, benzocaine, proparacaine, Betacaine-LA, topicaine, lidoderm, S-caine patchTM and local anesthetic peel. While using them, careful attention must be paid to their pharmacology, area and duration of application, age and weight of the patients and possible side-effects.

Publication Type
Efficacy of Different Precooling Agents and Topical Anesthetics on the Pain Perception during Intraoral Injection: A Comparative Clinical Study. [Review]


AIM: The purpose of this study was to compare the efficacy of the refrigerant (1,1,1,3,3-pentafluoropropane/1,1,1,2-tetrafluoroethane), benzocaine and ice on the pain perception during intraoral injection using visual analog scale (VAS) and sound, eye, motor (SEM) scale.

STUDY DESIGN: In this Spit-mouth design study, a total of 160 patients between the age group of 5 and 8 years were selected and were randomly divided into two equal groups having 80 patients in each group.

RESULTS: Ice cone has shown lower mean scores (p < 0.001) as compared to benzocaine and refrigerant whereas no significant difference was observed between refrigerant and benzocaine (p > 0.05) on both the scales.

CONCLUSION: Ice cone had shown significantly higher efficacy as compared to benzocaine and refrigerant. How to cite this article: Lathwal G, Pandit IK, Gugnani N, Gupta M. Efficacy of Different Precooling Agents and Topical Anesthetics on the Pain Perception during Intraoral Injection: A Comparative Clinical Study. Int J Clin Pediatr Dent 2015;8(2):119-122.

Pediatric dental sedation: challenges and opportunities. [Review]


High levels of dental caries, challenging child behavior, and parent expectations support a need for sedation in pediatric dentistry. This paper reviews modern developments in pediatric sedation with a focus on implementing techniques to enhance success and patient safety. In recent years, sedation for dental procedures has been implicated in a disproportionate number of cases that resulted in death or permanent neurologic damage. The youngest children and those with more complicated medical backgrounds...
appear to be at greatest risk. To reduce complications, practitioners and regulatory bodies have supported a renewed focus on health care quality and safety. Implementation of high fidelity simulation training and improvements in patient monitoring, including end-tidal carbon dioxide, are becoming recognized as a new standard for sedated patients in dental offices and health care facilities. Safe and appropriate case selection and appropriate dosing for overweight children is also paramount. Oral sedation has been the mainstay of pediatric dental sedation; however, today practitioners are administering modern drugs in new ways with high levels of success. Employing contemporary transmucosal administration devices increases patient acceptance and sedation predictability. While recently there have been many positive developments in sedation technology, it is now thought that medications used in sedation and anesthesia may have adverse effects on the developing brain. The evidence for this is not definitive, but we suggest that practitioners recognize this developing area and counsel patients accordingly. Finally, there is a clear trend of increased use of ambulatory anesthesia services for pediatric dentistry. Today, parents and practitioners have become accustomed to children receiving general anesthesia in the outpatient setting. As a result of these changes, it is possible that dental providers will abandon the practice of personally administering large amounts of sedation to patients, and focus instead on careful case selection for lighter in-office sedation techniques.

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Title
Anesthetic success of supplemental infiltration in mandibular molars with irreversible pulpitis: A systematic review. [Review]

Source

Abstract
AIM: To systematically review the anesthetic success rates of inferior alveolar nerve block (IANB) injection technique alone with that of combination of IANB and supplemental infiltration (SI) technique when used for pulpal anesthesia of mandibular posterior teeth with irreversible pulpitis during endodontic treatment.

SETTINGS AND DESIGN: The study follows a longitudinal study design involving original research.

MATERIALS AND METHODS: Electronic databases were systematically searched for randomized controlled clinical studies. Studies were selected by predefined inclusion and exclusion criteria.

STATISTICAL ANALYSIS USED AND RESULT: The statistical analysis used was based on the results of the original research. All the included studies showed that there is the difference in the values comparing the two techniques, but the data are not statistically significantly different.

CONCLUSION: Based on this review, the better anesthetic efficacy of the SI was observed.
Nitrous oxide as a conscious sedative in minor oral surgical procedure. [Review]


Abstract: Nitrous oxide (N₂O) is the most commonly used inhalation anesthetic in dentistry and is commonly used in emergency centers and ambulatory surgery centers as well. When used alone, it is incapable of producing general anesthesia reliably. However, as a single agent, it has an impressive safety and is excellent for providing minimal and moderate sedation for apprehensive minor oral surgical procedure. In this article, action of N₂O in overcoming the anxiety and pain of the patient during the minor oral surgery and its advantages and disadvantages, have been reviewed.

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Title: Phentolamine mesylate: It's role as a reversal agent for unwarranted prolonged local analgesia. [Review]


Abstract: Administration of local anesthesia is an integral procedure prior to dental treatments to minimize the associated pain. It is learned that its effect stays more than the time required for the dental procedure to be completed. This prolonged soft tissue anesthesia (STA) can be detrimental, inconvenient, and unnecessary. Phentolamine mesylate, a Food and Drug Administration-approved drug essentially serves the purpose of faster recovery from numbness at the site of local anesthesia. This article reviews the development of the drug phentolamine mesylate and its indication as a local anesthetic reversal agent. A literature search for phentolamine mesylate as a STA reversal agent was conducted in PubMed using the terms "dental local anesthesia reversal, phentolamine mesylate" up to March 2014. The search was limited to articles published in English. The search revealed 13 PubMed indexed articles stating the development and application of phentolamine mesylate. Phentolamine mesylate is an important step in the progress of developing patient care as well as an aid to the dental clinician.

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Authors: Virdee SS; Bhakta S; Seymour D.

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Title: Effective anaesthesia of the acutely inflamed pulp: part 2. Clinical strategies. [Review]

Abstract
Achieving profound pulpal anaesthesia in a mandibular molar diagnosed with irreversible pulpitis can be argued to be the most testing of dental anaesthetic challenges. Following discussion on the possible reasons for this occurrence in part 1, part 2 outlines the various local anaesthetic techniques that practitioners can use to overcome the acutely inflamed mandibular molar. They should then be able to apply these same principles to help anaesthetise any other tooth presenting with an acutely inflamed pulp. Techniques are discussed in detail along with key variables that have been associated with having an impact on the anaesthetic efficacy. This is to bring to light factors that can aid anaesthetic success as well as dispel common misnomers.

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Title
Effective anaesthesia of the acutely inflamed pulp: part 1. The acutely inflamed pulp. [Review]

Source

Abstract
Achieving profound pulpal anaesthesia in a mandibular molar diagnosed with irreversible pulpitis can be argued to be the most testing of dental anaesthetic challenges. Following discussion on the possible reasons for this occurrence in part 1, part 2 outlines the various local anaesthetic techniques that practitioners can use to overcome the acutely inflamed mandibular molar. They should then be able to apply these same principles to help anaesthetise any other tooth presenting with an acutely inflamed pulp. Techniques are discussed in detail along with key variables that have been associated with having an impact on the anaesthetic efficacy. This is to bring to light factors that can aid anaesthetic success as well as dispel common misnomers.

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Title
Reported side effects of intravenous midazolam sedation when used in paediatric dentistry: a review. [Review]

Source

Abstract
BACKGROUND: Intravenous (IV) midazolam may be of value as an alternative paediatric dental sedation technique, but there is some apprehension concerning its routine use due to a lack of evidence regarding its safety and side effects.
AIM: To review all available literature reporting the side effects of IV midazolam in children undergoing dental procedures.

DESIGN: Both randomised controlled trials (RCT) and non-randomised studies were reviewed. Reported side effects were categorised as either significant or minor, and the percentage prevalence of significant or minor side effects per episode of treatment was calculated.

RESULTS: Five RCTs were included, in which no significant side events were reported; however, minor side effects were recorded (n = 33, 19.5%), with paradoxical reaction being the most common (n = 11, 6.5%). Six non-randomised studies were included, in which no significant side effects were reported; however, minor side effects were reported (n = 118, 16.8%) with paradoxical reaction being the most common (n = 99, 12.7%).

CONCLUSIONS: Although no significant side effects were recorded, of the minor side effects reported paradoxical reaction was the most common. Due to inconsistency in side effect reporting, the authors suggest the application of a standardised adverse event reporting tool for future studies of sedation in paediatric dentistry.

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Recent Reviews Related to Dental Anaesthesia/Sedation

Results: Ninety articles qualified for this review: 39 published between 1971 and 2005 (older articles) and 51 published between 2006 and 2013 (newer articles). Specification of primary outcome analyses, methods to accommodate missing data, and adverse event collection methods and rates were generally poor. In some cases, there was apparent improvement from the older to the newer cohort; however, reporting of these methodological details remained inadequate even in the newer articles.

Practical Implications: This review is designed to alert authors, reviewers, editors, and readers of TMD clinical trials to these issues and improve reporting quality in the future.

The Implications of Substance Misuse for Intravenous Conscious Sedation Practice. [Review]

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

Intercollegiate Advisory Committee for Sedation in Dentistry: Review of the Guidelines Published in April 2015.

This review article considers the development of the Intercollegiate Advisory Committee for Sedation in Dentistry (IACSD) guideline produced by the four dental faculties of the Royal Colleges and the Royal College of Anaesthetists for conscious sedation.
sedation use in dentistry. An outline of the scope of the document, which aims to set definitive standards for conscious sedation provision within the dental environment, is given. The IACSD guideline sets a national standard for all aspects of dental conscious sedation provision, from training of the team, environment requirements and clinical delivery; it is therefore a requirement that all dentists, doctors and healthcare professionals providing, or supporting, dental conscious sedation are aware of the content.

CPD/Clinical Relevance: This article should help with the understanding of the development background, scope of the guideline and relevance to the dental practice of dental conscious sedation.

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Title
Intraoperative Fluids and Fluid Management for Ambulatory Dental Sedation and General Anesthesia. [Review]
Source
Local Messages

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Abstract
Intravenous fluids are administered in virtually every parenteral sedation and general anesthetic. The purpose of this article is to review the physiology of body-water distribution and fluid dynamics at the vascular endothelium, evaluation of fluid status, calculation of fluid requirements, and the clinical rationale for the use of various crystalloid and colloid solutions. In the setting of elective dental outpatient procedures with minor blood loss, isotonic balanced crystalloid solutions are the fluids of choice. Colloids, on the other hand, have no use in outpatient sedation or general anesthesia for dental or minor oral surgery procedures but may have several desirable properties in long and invasive maxillofacial surgical procedures where advanced hemodynamic monitoring may assess the adequacy of intravascular volume.

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Title
Dexmedetomidine: A Review of a Newer Sedative in Dentistry. [Review]
Source
Local Messages

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Abstract
UNLABELLED: Dexmedetomidine is a central alpha-2 agonist, similar to Clonidine, but 8 times more specific for the central alpha-2 receptor which causes sedation with minimal depression of respiration, making it safe for sedation during procedures. It is widely used in the field of medicine for many procedures especially premedication, awake intubation, and sedation of patients in intensive care units and pediatric procedural sedation.

OBJECTIVE: To do a systematic review of the pharmacology, pharmacodynamics, as well as the usage of newer sedative drug-Dexmedetomidine in dentistry.
STUDY DESIGN: The search for articles was conducted in PubMed, including the articles published in English until Oct 2014. Both animal and human studies were included using the key words, "Dexmedetomidine", "Dexmedetomidine in sedation", "Dexmedetomidine in Dentistry", and "Dexmedetomidine in Pediatric dentistry". The Articles obtained were checked for their quality methodology and inference of the studies and selected for review.

RESULTS: Initial search retrieved 2436 articles, out of which 44 articles were on the subject of Dexmedetomidine in dentistry. Five of which articles were on the usage of Dexmedetomidine in pediatric dentistry. These studies were included in systematic review.

CONCLUSION: The study revealed that Dexmedetomidine being a new drug with its added advantages makes a better choice for sedation in dentistry. But with limited studies on Dexmedetomidine, the recommendation to use the drug exclusively is still under debate.

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.

SEARCH METHODS: In this updated review, we searched the Cochrane Central Register of Controlled Trials (CENTRAL; 2015, Issue 7); MEDLINE Ovid SP (1950 to July 2015); EMBASE Ovid SP (1974 to July 2015); System for Information on Grey Literature in Europe (SIGLE) (1980 to October July 2012); Latin American & Caribbean Health Sciences Literature (LILACS) (1982 to July 2015); and Institute for Scientific Information (ISI) Web of Science (1945 to July 2015). We also carried out handsearching of relevant journals to July 2015. We imposed no language restriction.

SELECTION CRITERIA: We planned to include randomized controlled clinical trials that compared sedative agents versus general anaesthesia in children and adolescents up to 18 years of age undergoing dental treatment. We excluded complex surgical procedures and pseudo-randomized trials.

DATA COLLECTION AND ANALYSIS: Two review authors assessed titles and abstracts for inclusion in the review. We recorded information relevant to objectives and outcome measures by using a specially designed 'data extraction form'. We will employ the Grades of Recommendation, Assessment, Development and Evaluation Working Group (GRADE) approach to interpret findings.

MAIN RESULTS: In our original review, we identified 16 studies for potential inclusion after searching available databases and screening titles and abstracts. After retrieving full-text studies, we found none to be eligible. We identified no additional studies in the updated search of July 2012. We identified two studies for possible inclusion in the updated search of July 2015; again we found these to be ineligible.

AUTHORS' CONCLUSIONS: Randomized controlled studies comparing use of dental general anaesthesia versus sedation are needed to quantify differences such as morbidity and cost.

Publication Type: Journal Article. Research Support, Non-U.S. Govt. Review.
Phentolamine mesylate to reverse oral soft-tissue local anesthesia: A systematic review and meta-analysis. [Review]

BACKGROUND: Knowing that patients desire reduced duration of local anesthesia, the authors performed a meta-analysis to evaluate the efficacy of phentolamine mesylate (PM) in reducing anesthesia duration and the occurrence of adverse effects.

TYPES OF STUDIES REVIEWED: The authors searched studies in 4 electronic databases up to December 18, 2014. For each study, the methodological quality was assessed according to the Cochrane Collaboration's tool for assessing risk of bias. Randomized controlled trials (RCTs) that used PM met the inclusion criteria.

RESULTS: Six RCTs met the inclusion criteria and were used to carry out a meta-analysis of the effectiveness of PM and a qualitative analysis of its adverse effects. The use of PM was more effective in reversing the anesthetic effect on the lower lip and tongue than was applying a placebo. Adverse effects reported in the studies were not statistically significant, the most frequent being headache, pain during injection, and postprocedure pain.

CONCLUSIONS AND PRACTICAL IMPLICATIONS: Based on limited evidence, PM is effective in reducing the persistence of anesthesia duration on the lower lip and tongue, with infrequent adverse effects of little clinical significance.
Anesthesia for Children With Craniofacial Abnormalities in the Developing Countries: Challenges and Future Directions. [Review]

Abstract
Interest in global health to provide safer pediatric surgical care in developing countries has increased during the last decade. A collaborative effort between surgeons and anesthesiologists has provided the opportunity to deliver specialized care to children, particularly in the areas of cleft lip and palate repair. However, medical resources, facilities, and adequately trained personnel, especially in pediatric anesthesia, are often limited in these countries. Challenges, educational efforts, and future directions for the globalization of anesthesia are discussed. Involvement of international entities may help raise awareness, channel efforts, expand programs and encourage volunteerism to ultimately provide safer care to pediatric patients, have better outcomes and reduced anesthesia-related morbidity and mortality.

Problems Facing the Visiting Anesthesia Team in an Underdeveloped Nation and Possible Solutions. [Review]

Abstract
More than 50% of the population in most developing countries is younger than 18 years, and it has been estimated that 85% of these children may require some sort of surgery before their 15th birthday. Common congenital surgical requirements are for cleft lip and palate, inguinal hernia, meningomyelocle, as well as hydrocephalus. In addition, there is a greater incidence of trauma experienced by pediatric patients. Burn and scald injuries are also common because of the proximity of domestic open fires and boiling pots of water. Infectious conditions such as osteomyelitis and skin abscesses are more frequent in developing countries than in the developed world. Given this backdrop, the visiting anesthesiology team is faced with significant logistic issues related to a large and varied set of surgeries. This requires careful planning to ensure there will be enough personnel, equipment, and drugs available for the trip. Anesthesia teams very often have to rely on their own supplies on these excursions. Careful questioning of previous visiting groups is vital in preparation. For example, it is pointless to bring cases of sevoflurane to an operating room where the anesthesia machine only has a halothane vaporizer.
Abstract

In recent times there has been raised interest regarding the use of articaine hydrochloride as a dental local anaesthetic solution. The use of articaine hydrochloride as a dental local anaesthetic agent has been reported to be safe and effective. Paraesthesia is a rare but unwanted adverse effect attributed to the use of this local anaesthetic in dentistry, particularly following the administration of a nerve block injection. There is no evidence to support the opinion that the use of articaine carries a greater associated risk of paraesthesia than with the use of any other local anaesthetic. Clinical Relevance: The aim of this article is to review the relative merits of articaine hydrochloride against its documented potential drawbacks. The article will also aim to update readers on the use of articaine hydrochloride for local analgesia in dentistry, including the pharmacology, efficacy and safety concerns (including the risks of nerve paraesthesia) commonly associated with the administration of this agent.

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Title
Depth of anaesthesia monitoring during procedural sedation and analgesia: a systematic review protocol. [Review]

Source
Systematic Reviews. 4:70, 2015 May 16.

Abstract

BACKGROUND: Procedural sedation and analgesia (PSA) is used to attenuate the pain and distress that may otherwise be experienced during diagnostic and interventional medical or dental procedures. As the risk of adverse events increases with the depth of sedation induced, frequent monitoring of level of consciousness is recommended. Level of consciousness is usually monitored during PSA with clinical observation. Processed electroencephalogram-based depth of anaesthesia (DoA) monitoring devices provide an alternative method to monitor level of consciousness that can be used in addition to clinical observation. However, there is uncertainty as to whether their routine use in PSA would be justified. Rigorous evaluation of the clinical benefits of DoA monitors during PSA, including comprehensive syntheses of the available evidence, is therefore required. One potential clinical benefit of using DoA monitoring during PSA is that the technology could improve patient safety by reducing sedation-related adverse events, such as death or permanent neurological disability. We hypothesise that earlier identification of lapses into deeper than intended levels of sedation using DoA monitoring leads to more effective titration of sedative and analgesic medications, and results in a reduction in the risk of adverse events caused by the consequences of over-sedation, such as hypoxaemia. The primary objective of this review is to determine whether using DoA monitoring during PSA in the hospital setting improves patient safety by reducing the risk of hypoxaemia (defined as an arterial partial pressure of oxygen below 60 mmHg or percentage of haemoglobin that is saturated with oxygen [SpO(2)] less than 90 %). Other potential clinical benefits of using DoA monitoring devices during sedation will be assessed as secondary outcomes.

METHODS/DESIGN: Electronic databases will be systematically searched for randomized controlled trials comparing the use of depth of anaesthesia monitoring devices with clinical observation of level of consciousness during PSA. Language restrictions will not be imposed. Screening, study selection and data extraction will be performed by two independent reviewers. Disagreements will be resolved by discussion. Meta-analyses will be performed if suitable.

DISCUSSION: This review will synthesise the evidence on an important potential clinical benefit of DoA monitoring during PSA within hospital settings.
**Hypnosis/Relaxation therapy for temporomandibular disorders: a systematic review and meta-analysis of randomized controlled trials.**

**AIMS:** To conduct a systematic review and meta-analysis to evaluate the effectiveness of hypnosis/relaxation therapy compared to no/minimal treatment in patients with temporomandibular disorders (TMD).

**METHODS:** Studies reviewed included randomized controlled trials (RCTs) where investigators randomized patients with TMD or an equivalent condition to an intervention arm receiving hypnosis, relaxation training, or hyporelaxation therapy, and a control group receiving no/minimal treatment. The systematic search was conducted without language restrictions, in Medline, EMBASE, CENTRAL, and PsycINFO, from inception to June 30, 2014. Studies were pooled using weighted mean differences and pooled risk ratios (RRs) for continuous outcomes and dichotomous outcomes, respectively, and their associated 95% confidence intervals (CI).

**RESULTS:** Of 3,098 identified citations, 3 studies including 159 patients proved eligible, although none of these described their method of randomization. The results suggested limited or no benefit of hypnosis/relaxation therapy on pain (risk difference in important pain -0.06; 95% CI: -0.18 to 0.05; \( P = .28 \)), or on pressure pain thresholds on the skin surface over the temporomandibular joint (TMJ) and masticatory muscles. Low-quality evidence suggested some benefit of hypnosis/relaxation therapy on maximal pain (mean difference on 100-mm scale = -28.33; 95% CI: -44.67 to -11.99; \( P = .007 \)) and active maximal mouth opening (mean difference on 100-mm scale = -2.63 mm; 95% CI: -3.30 mm to -1.96 mm; \( P < .001 \)) compared to no/minimal treatment.

**CONCLUSION:** Three RCTs were eligible for the systematic review, but they were with high risk of bias and provided low-quality evidence, suggesting that hypnosis/relaxation therapy may have a beneficial effect on maximal pain and active maximal mouth opening but not on pain and pressure pain threshold. Larger RCTs with low risk of bias are required to confirm or refute these findings and to inform other important patient outcomes.

**Source**

**Abstract**

**AIMS:** To conduct a systematic review and meta-analysis to evaluate the effectiveness of hypnosis/relaxation therapy compared to no/minimal treatment in patients with temporomandibular disorders (TMD).

**METHODS:** Studies reviewed included randomized controlled trials (RCTs) where investigators randomized patients with TMD or an equivalent condition to an intervention arm receiving hypnosis, relaxation training, or hyporelaxation therapy, and a control group receiving no/minimal treatment. The systematic search was conducted without language restrictions, in Medline, EMBASE, CENTRAL, and PsycINFO, from inception to June 30, 2014. Studies were pooled using weighted mean differences and pooled risk ratios (RRs) for continuous outcomes and dichotomous outcomes, respectively, and their associated 95% confidence intervals (CI).

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**CONCLUSION:** Three RCTs were eligible for the systematic review, but they were with high risk of bias and provided low-quality evidence, suggesting that hypnosis/relaxation therapy may have a beneficial effect on maximal pain and active maximal mouth opening but not on pain and pressure pain threshold. Larger RCTs with low risk of bias are required to confirm or refute these findings and to inform other important patient outcomes.
withdrawal; and cigarette craving. (1) However, in more recent years, these drugs have been used as adjuncts for sedation and to reduce anesthetic requirements. This review will provide an historical perspective of this drug class, an understanding of pharmacological mechanisms, and an insight into current applications in clinical anesthesiology.

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Ellis, Edward 3rd. Professor and Chair, Department of Oral and Maxillofacial Surgery, University of Texas Health Science Center, San Antonio, TX.

**Title**
Local versus general anesthesia for the management of nasal bone fractures: a systematic review and meta-analysis. [Review]

**Comments**

**Source**

**Abstract**
PURPOSE: The aim of this study was to answer the following question: in patients with nasal bone fractures (NBFs), does closed reduction under local anesthesia (LA) produce comparable outcomes as closed reduction under general anesthesia (GA)?

MATERIALS AND METHODS: A systematic review with meta-analysis and a comprehensive electronic search without date and language restrictions was performed in August 2014. The inclusion criteria were studies in humans, including randomized or quasi-randomized controlled trials (RCTs), controlled clinical trials (CCTs), and retrospective studies whose aim was comparing clinical outcomes between LA and GA for closed reduction of NBFs.

RESULTS: Eight publications were included: 3 RCTs, 2 CCTs, and 3 retrospective studies. Three studies showed a low risk of bias, and 5 studies showed a moderate risk of bias. There was no statistical difference between LA and GA for closed reduction of NBFs with regard to patient satisfaction with anesthesia, patient satisfaction with function of the nose, need for subsequent re-treatment (septoplasty, septrhinoplasty, or rhinoplasty with re-fracture), and a patient’s chosen treatment for a re-fracture of the nose. There was a statistical difference between LA and GA for closed reduction of NBFs with regard to patient satisfaction with the appearance of the nose.

CONCLUSION: Regardless of the cost and risks associated with GA, the results of the meta-analysis showed that GA provides better patient satisfaction with anesthesia, appearance and function of the nose, and preference of treatment for a re-fracture of the nose. In addition, the meta-analysis showed that GA decreased the number of subsequent corrective surgeries (septoplasty, septrhinoplasty, and rhinoplasty) required.

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Local anesthetic systemic toxicity (LAST) is a rare but avoidable consequence of local anesthetic overdose. This article will review the mechanism of action of local anesthetic toxicity and the signs and symptoms of LAST. Due to physiologic and anatomic differences between children and adults, LAST occurs more frequently in children; particularly when 3% mepivacaine is administered. The calculation of the maximum recommended dose based on mg/lb body weight, Clark's rule, and the Rule of 25 in order to prevent LAST will also be reviewed, as well as the appropriate treatment procedures for a local anesthetic overdose.

Abstract

Local anesthetic systemic toxicity (LAST) is a rare but avoidable consequence of local anesthetic overdose. This article will review the mechanism of action of local anesthetic toxicity and the signs and symptoms of LAST. Due to physiologic and anatomic differences between children and adults, LAST occurs more frequently in children; particularly when 3% mepivacaine is administered. The calculation of the maximum recommended dose based on mg/lb body weight, Clark's rule, and the Rule of 25 in order to prevent LAST will also be reviewed, as well as the appropriate treatment procedures for a local anesthetic overdose.

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