



## Alcohol-Containing Mouthwashes Increase Oral Cancer Risk

*The Role of Alcohol in Oral Carcinogenesis With Particular Reference to Alcohol-Containing Mouthwashes.*

McCullough MJ, Farah CS:

Aust Dent J 2008; 53 (December): 302-305

The use of ethanol-containing oral rinses increases the risk for oral carcinoma. Therefore, prescribing agents that contain higher concentrations of alcohol for chronic use is probably not a good idea.

**Background:** Despite all advances in prevention and therapy, the 5-year survival rate for oral carcinoma remains at 50%. Cigarette and cigar smoking, alcohol drinking, and smokeless tobacco chewing are known carcinogenic habits. In addition, the incidence of human papilloma viral-related oral cancers has increased. Other agents implicated are Epstein-Barr virus and oral *Candida albicans*. Also, a diet low in carotenoids and vitamin A and poor oral hygiene are risk factors for oral cancer. The combination of alcohol consumption and smoking raises the risk for oral cancer by 50-fold. Therefore, the more frequently the oral mucosa is exposed to alcohol and smoke products, the greater the likelihood of carcinoma developing.

**Objective:** To assess the alcohol content of various mouthwashes and to evaluate the level of alcohol exposure required to increase the risk of oral carcinoma.

**Results:** A prospective study in health professionals (58% were dentists) found that alcohol consumption alone was a risk for oral premalignant lesions. The proposed mechanism for alcohol carcinogenesis is that alcohol exposure enhances the penetration of carcinogens like tobacco smoke into the oral mucosa. Alcohol can alter the lipid portion of the cell membrane of the spinous layer. Mucosa of the floor of the mouth has been shown to have increased permeability by a short-term exposure to 15% alcohol. Alcohol is routinely used in oral rinses. At 10% to 12% concentration, the alcohol acts as a preservative and antiseptic in these products. This article lists a number of ethanol containing oral rinses. At the top of the list was Listerine® (26% alcohol). The alcohol content of all the related Listerine products ranged from 22% to 26%. Some of the products with no ethanol were Biotene®, Amosan®, Oral-B®, and Curasept®. The in vitro studies showed an epithelial effect with short-term exposure to 15% alcohol.

**Conclusions:** There is a risk for generating oral carcinoma with the use of ethanol-containing oral rinses.

**Reviewer's Comments:** This article reviewed many published articles, both basic science and clinical, and the authors concluded that there is a problem with using alcohol-containing mouthwashes. What does this mean for the clinical dentist? Many of us prescribe chlorhexidine, an alcohol-containing product. Chlorhexidine has been shown to be effective when used for 2 weeks followed by a 2-month to 3-month hiatus. This would minimize the patient's exposure to the high alcohol content of the chlorhexidine rinse and it would minimize tooth staining. It is probably not a good idea for us to prescribe agents that contain higher concentrations of alcohol for chronic use. (Reviewer-Dennis Flanagan, DDS).

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Keywords: Mouthwash vs Carcinogenesis

Print Tag: Refer to original journal article

## Old Gutta-Percha Not Fully Removed During Retreatment

*Effectiveness of Two Nickel-Titanium Rotary Instruments and a Hand File for Removing Gutta-Percha in Severely Curved Root Canals During Retreatment: An Ex Vivo Study.*

Gergi R, Sabbagh C:

Int Endod J 2007; 40 (July): 532-537

In general during root canal retreatment, there is increased anatomical variability and difficulty of instrumentation in the apical region. Rotary NiTi systems proved to be effective for gutta-percha removal.

**Background:** To retreat a tooth, the obturation material must be safely and efficiently removed from the canal system. Ideally, all filling material and sealer must be removed from canal walls to gain access to microorganisms and pulp tissue remnants that lead to the failure of the prior endodontic treatment. Gutta-percha removal is usually accomplished with hand instruments or in combination with rotary instruments, which may involve solvents.

**Objective:** To determine the effectiveness of hand files and rotary instruments for removing gutta-perch from curved root canals.

**Methods:** 90 extracted teeth with severe angles of curvature were obtained. Access openings were prepared into the pulp chamber. A size 10 K-file was placed into the canal until it was visible at the apical foramen - the working length was established at 0.5 mm short of this length. The final size of the apical preparation was standardized. This was followed by a preparation with rotary NiTi instruments 0.5 mm short of the working length. Canals were prepared with a 0.04 taper. Canals were obturated with a gutta-percha cone lightly coated with sealer and then vertically condensed with a System B unit. The prepared and filled roots were randomly assigned to 1 of 3 groups. All instruments were used in a crown-down technique on a rotary engine-driven motor with constant speed and light apical pulses of pressure to remove the gutta-percha and sealer. When rotary instruments could not reach working length, a stainless steel file was used to negotiate the canal, after which rotary instruments were used to working length. In the hand file retreatment group, Hedström files were used in the canals to re-instrument in a crown-down technique using a circumferential quarter-turn push-pull filing motion to remove the obturation material until the working length was achieved with a size 25 H-type file.

**Results:** <20% of the teeth had completely clean root canals. When evaluated radiographically, most of the canals had obturation material remaining. The evaluation of the total percentage of remaining obturation material did not reveal any statistically significant differences in effectiveness for the removal techniques with rotary instruments or hand files.

**Conclusions:** Under the study's experimental conditions, both rotary NiTi systems proved to be effective and safe devices for gutta-percha removal in root canal retreatment. Nonetheless, all instruments may leave filling material inside the root canal system, especially in the apical third.

**Reviewer's Comments:** The goal in retreatment is to remove as much of the obturation material as possible so that any necrotic tissue or bacteria present in the canal can be removed so that the subsequent treatment seals the canal system and eliminates the periapical inflammation. (Reviewer-Gregori M. Kurtzman, DDS).

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Keywords: Root Canal Retreatment

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## Maxillary Teeth Can Be Extracted Without Palatal Injection

*Comparison of the Efficiencies of Permanent Maxillary Tooth Removal Performed With Single Buccal Infiltration Versus Routine Buccal and Palatal Injection.*

Fan S, Chen WL, et al:

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 107 (March): 359-363

When extracting maxillary teeth, 1.7 mL of 4% articaine/HCl in a buccal infiltration is sufficient to overcome the need for palatal injection.

**Background:** Approximately 5% of the population avoids dental treatment due to fear of injections. Of these, the palatal injection is among the most feared and causes more pain than injections in less dense soft tissues of the mucosa.

**Objective:** To compare the efficacy of a buccal injection of articaine/HCl with that of a buccal and palatal injection for the extraction of maxillary teeth.

**Design:** Prospective, blinded, randomized, controlled trial.

**Methods:** 38 men and 33 women (mean age, 25.37 years) were selected for the study. The extracted teeth included wisdom teeth (partly or fully erupted) and anterior to posterior maxillary teeth, including premolars and molars. Each patient had a control side and an experimental side. The patients rated pain on a 100-point Visual Analogue Scale (VAS) on which 0 points represented "no pain" and 100 points represented "worst pain." Patients were also asked to answer the question, "Is the extraction acceptable or unacceptable?" On the experimental side, an injection of 1.7 ml of 4% articaine/HCl with epinephrine 1:100,000 was delivered over 1 minute. On the control side, the buccal injection was identical and an injection of 0.4 ml was given on the palatal side. There was a 5-minute delay prior to the procedure. At this time, the patient was asked to fill out the VAS as to the pain on injection. The surgeon extracting the teeth was not informed of the control and experimental sides to ensure blinding.

**Results:** The VAS score was 37.70 for injection on the control side and was 25.73 for the experimental side. This difference was statistically significant. The mean VAS score was 14.68 for extraction using only buccal infiltration and was 12.82 for bilateral injection (difference not significant). All patients rated the procedure as acceptable. The pain was less than expected on the experimental side for 90.1% of patients and was less than expected on the control side for 94.4% of patients.

**Conclusions:** Patients experienced greater discomfort on buccal injection versus both buccal and palatal injection. However, they did not experience statistically significant greater discomfort on extraction of teeth from either side. Injection of 1.7 mL of 4% articaine/HCl into the buccal vestibule provides similar clinical efficacy to the routine type of anesthesia with palatal injection.

**Reviewer's Comments:** This is a very strong study because it is prospective, blinded, and randomized. It may take a leap of faith to try this in clinical practice, but the rewards seem worth it for the practitioner and patient alike. (Reviewer-Ryaz Ansari, DDS).

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Keywords: Anesthesia for Exodontia

Print Tag: Refer to original journal article

## Daily Use of Xylitol-Containing Chewing Gums Prevents Caries

*The Impact of Polyol-Containing Chewing Gums on Dental Caries: A Systematic Review of Original Randomized Controlled Trials and Observational Studies.*

Deshpande A, Jadad AR:

J Am Dent Assoc 2008; 139 (December): 1602-1614

The polyol-containing chewing gums are most effective at dental caries prevention when used daily. This daily use changes the dynamics of salivary flow and has a direct effect on *Streptococcus mutans*.

**Background:** Most humans experience dental caries, but the incidence of caries has continually decreased in the United States. As determined by Featherstone and others, this decrease is attributed to chronic exposure of teeth to topical fluoride. However, certain specific populations in the U.S. and Australia are actually having an increase in the incidence of dental caries. To help prevent dental caries, topical fluoride is applied at home and in the dental office, and we recommend a decrease in dietary sugar intake. However, worldwide sugar consumption increases annually, probably due to the increase in sugared food and beverages being sold in Asian countries. Because of dental caries and the increase in obesity, an interest in sugar substitutes has emerged. One class of these sugar substitutes is the polyols, or sugar alcohols. These chemicals are nonfermentable sugars. Sorbitol and xylitol are the most commonly used of these, especially in chewing gum. Gum chewing increases salivary flow, thus removing acidity and enhancing enamel remineralization. This can be helpful when there are initial carious lesions, the white spots on demineralized enamel. Xylitol, in particular, attacks *Streptococcus mutans*. Xylitol is thought to be noncariogenic or even anticariogenic. Sorbitol is not as effective as xylitol.

**Objective:** To define the evidence of caries prevention through the use of polyol-containing chewing gums.

**Methods:** A literature search was performed, and the articles were screened for appropriateness. Of the 231 screened articles, a credibility assessment was made, leaving only 19 articles. All of the studies were randomized controlled trials or clinical controlled trials performed in the U.S., Finland, Canada, Denmark, Hungary, Lithuania, Estonia, and China. All examined the use of polyols in chewing gum used by school-aged children. The daily doses of xylitol and sorbitol ranged from 2.9 grams to 10.67 grams. The ratio of xylitol to sorbitol ranged from 3:40 to 1.27:1. A few studies included mannitol.

**Results/Conclusions:** Chewing gum that contained a polyol was more beneficial to caries prevention than was chewing gum without a polyol. In this article, the use of polyols in chewing gum is validated, and polyol-containing gum is most effective when used daily. Apparently, this daily use affects caries initiation by changing the dynamics of salivary flow and has a direct effect on *S mutans*. While this review demonstrated the effectiveness of some polyols, there are unknowns when it comes to daily polyol dose and efficacy of different related polyols.

**Reviewer's Comments:** Although this study was funded by a company that makes xylitol containing chewing gum, the data appear to demonstrate that the polyols have a beneficial effect for caries reduction. (Reviewer-Dennis Flanagan, DDS).

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Keywords: Chewing Gums & Caries Prevention

Print Tag: Refer to original journal article

## Mini Implants Support Fixed Prosthesis in Selected Sites

*Fixed Partial Dentures and Crowns Supported by Very Small Diameter Dental Implants in Compromised Sites.*

Flanagan D:

Implant Dent 2008; 17 (June): 182-191

The surgical placement of mini implants is much less traumatic as compared with standard-size implants. Therefore, mini implants may be useful for medically compromised or elderly patients.

**Background:** Following the loss of teeth and years of bone resorption, patients may present for implant treatment with variable amounts of bone volume, length and height of ridge, and interocclusal space. As a result of these dimensional changes, some sites cannot accept standard-sized implants without significant site development. Bone augmentation is an option for increasing the available bone volume if a standard-diameter implant is required by the clinician. But the additional costs and time involved with grafting may place implant treatment beyond the abilities of some patients. Mini-diameter implants can fit into many of these atrophic sites with adequate interimplant and interocclusal spacing. These mini-diameter implants can fit into those sites that cannot accept standard-diameter implants without augmentation of the soft tissue. The bone at the crest of a thin atrophic ridge may be dense cortical bone, which is ideal for immediate support for these mini implants. Mandibular posterior sites not in the esthetic zone may be appropriate for mini-diameter implants that support fixed prosthetics. When placing mini implants, placement torque should not exceed 50 Ncm. Over-compression of the bone may lead to osseous compression necrosis, which may then lead to failure of the implant to integrate. If resistance is met during placement of the mini fixture, counter rotation of the fixture and then further forward advancement will allow easier placement with less torque required. With regard to design of the fixed prosthesis, the buccal-lingual dimension will need to be narrower than natural teeth to limit off-axis loading, and a flat occlusal surface is indicated to prevent lateral loading of the prosthesis. Additionally, the interproximal contacts should be as broad as possible in the posterior to provide added stability under load, and in the anterior, the proximal contact should be very light so that, under load, the natural teeth are not forcing the implant prosthesis buccally.

**Conclusions:** Use of these mini implants should be confined to type I and II bones. Their use should be avoided in the softer type III and IV bones. Because the surface area of these implants is lower than in standard fixtures, the anterior fixtures should be at least 13 mm within bone. In the posterior, due to the direction of force, shorter fixtures can be utilized, but the practitioner may wish to increase the number of fixtures being used, which may place 2 at a molar site to improve load handling.

**Reviewer's Comments:** Mini implants can improve the quality of life for those patients who have inadequate ridge width and for whom grafting is precluded due to finances or other factors that would be required if standard fixtures were to be used. (Reviewer-Gregori M. Kurtzman, DDS).

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Keywords: Mini Implants

Print Tag: Refer to original journal article

## Dental Implant Failure Risk Increases in Irradiated Bone

*Effects of Radiation Therapy on Craniofacial and Dental Implants: A Review of the Literature.*

Ihde S, Kopp S, et al:

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 107 (January): 56-65

The risk of implant failure is significantly higher in irradiated bone than in nonirradiated bone, and this risk is dose-dependent.

**Background:** Radiation therapy to the jaws results in diminished cellularity, vascularity, and oxygenation.

**Objective:** To determine the success of implant placement in irradiated bone, especially with respect to dose levels, timing, location, and materials.

**Methods:** A literature search was carried out for studies comparing the success and failure of craniofacial and dental implants in irradiated bone and nonirradiated bone. Eleven animal studies were included in the review, and 16 human studies met the inclusion criteria (craniofacial implants, 8; dental implants, 8). Because the studies were of poor to moderate quality, the authors warned that all conclusions should be accepted with caution.

**Results:** The animal studies demonstrated that implant integration was much less in irradiated bone than in nonirradiated bone. The pull-out force, breakpoint torque, and the force required to unscrew titanium implants were all considerably diminished in irradiated bone. In the human studies, the craniofacial implant failure rates were as much as 12 times greater in irradiated bone versus healthy bone. These, however, were not very strong studies, and the results were based on times as short as 1 year. This was in direct contrast to human studies on dental implants. Of the 8 studies, only 3 reported a significant difference in failure rates, and those that did quantified the failure rate at 2 to 3 times greater in irradiated bone versus nonirradiated bone. With respect to timing of implant placement, most studies did not show a difference in success whether implants were placed <1 year or >1 year after radiation. In terms of location, implants were much less likely to fail in mandibular irradiated bone when compared with maxillary placement. Finally, on the role of hyperbaric oxygen therapy, no conclusions could be derived with respect to implant success rate.

**Conclusions:** Radiation affects bone physiology, and therefore, it affects the success rate of dental implant treatment in humans. The risk of dental implant failure is 2 to 3 times higher in irradiated bone in those studies that found a statistically significant difference. In the human jaw, lower doses of radiation correlate with increased implant success. Less than 45 Gy of radiation resulted in no failures.

**Reviewer's Comments:** Implants can and are placed in irradiated patients with good success. There are not enough good quality studies yet to provide us with a protocol with respect to timing of placement and loading these implants, and there is insufficient evidence with respect to the use of hyperbaric oxygen therapy. However, in the United States, it should be considered in the treatment when available. (Reviewer-Ryaz Ansari, DDS).

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Keywords: Implant Failure in Irradiated Bone

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## Effects of Nonsurgical Caries Management Being Evaluated

*The Monitor Practice Programme: Is Non-Invasive Management of Dental Caries in Private Practice Effective?*

Curtis B, Evans RW, et al:

Aust Dent J 2008; 53 (December): 306-313

Treatment of dental caries can be determined by the clinical judgement of the attending dentist. New agents are available to help in nonsurgical therapy, such as the casein phosphopeptide-amorphous calcium phosphates.

**Background:** Some carious lesions may be managed by noninvasive or pharmacologic therapy. Carious lesions that are only in enamel and not cavitated can be managed by remineralization. During caries progress, there is an exchange of ions that is a part of the demineralization-remineralization process. When there is no cavitation, the usual result of remineralization is an arrest of the caries process. Surgical restoration of caries costs society an enormous amount of money. One model determined that the restoration that a tooth receives over a lifetime costs about \$1800. Medically managing dental caries has been studied, but there has been a lack of methodology and accuracy.

**Objective:** To evaluate noninvasive caries management in private dental practices.

**Methods:** The dental practices evaluated in this study were located in cities, suburban, and rural locations. Twelve practices were instructed to manage caries in a noninvasive format, and 10 other practices acted as control practices where conventional surgical restorative dentistry was performed. The results were problematic due to the variability of charting and radiographic interpretation. The evaluators viewed bitewings and determined which caries were reversed or arrested and which were not. However, all patients could not be followed up consistently. The effectiveness of the noninvasive treatment was measured by DMFS criteria (decayed, missing, and filled surfaces).

**Results:** The effects of age, gender, health status, fluoride exposure, and DMFS baseline on the 2-year DMFS outcome were evaluated for 902 patients. Of these patients, 847 were able to complete the program. The nonsurgical patients were managed with a Caries Management System (a 10-step protocol). The resulting data demonstrated a lower DMFS for patients in the nonsurgically treated practices than in the control practices. In the nonsurgical group, 26% of patients had a lessened risk for caries, 11% had an increased risk, and 63% were deemed to have no change in caries risk.

**Reviewer's Comments:** Opinions are highly variable as to what is necessary versus unnecessary treatment. The nonsurgical management of caries is now being researched so that we may have a definitive guideline as to what to restore and what to manage nonsurgically. There is no evidence that nonsurgical management is cost-effective. However, we should not abandon noninvasive therapy. Many patients can be evaluated and treated as determined by the clinical judgement of the attending dentist. There are new agents to help in nonsurgical therapy, such as the casein phosphopeptide-amorphous calcium phosphates. (Reviewer-Dennis Flanagan, DDS).

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Keywords: Nonsurgical Caries Management

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# Canal Transportation Problem With Curved Root Canals

*Development and Sequela of Canal Transportation.*

Schafer E, Dammaschke T:

Endodontic Topics 2009; 15 (1): 75-90

Instruments with a non-cutting tip exert less canal transportation and lead to more material removal at the inner curvature of curved root canals compared with similar instruments having cutting tips.

**Background:** The primary goal of preparation of the root canal system is to enlarge the canal space to facilitate disinfection by antibacterial agents and to prevent re-infection through the placement of a fluid-tight obturation. The mechanical preparation of a curved root canal is a challenge for very skilled and experienced clinicians. As root canals have some curvature within the canal, a high prevalence of preparation errors or canal aberrations has been reported in the literature.

**Objective:** Canal transportation is defined as, "Removal of canal wall structure on the outside curve in the apical half of the canal due to the tendency of files to restore themselves to their original linear shape during canal preparation; may lead to ledge formation and possible perforation." As a result, the long axis of the curved root canal will be displaced during preparation and the angle of curvature will decrease, resulting in straightening of the original curvature of the root canal. Independent of whether the file is made of stainless steel or nickel-titanium (NiTi), any root canal instrument tends to straighten itself inside the root canal.

**Results:** Canal curvatures are better maintained with NiTi hand instruments than with stainless-steel ones. Better maintenance of the original canal curvature was associated with a better prognosis. In the literature, some evidence has been gained from laboratory studies that canal transportation is correlated with apical leakage. It can be concluded that canal transportation seems not to be the direct cause of reduced treatment outcome or even failure. Rather, this increases the risk of leaving behind infected tissue in the uninstrumented portions of the canal. Canal transportation is correlated with a huge amount of debris and microorganisms left in the apical portion of the root canal.

**Conclusions:** Canal transportation is an inherent problem when enlarging curved root canals, irrespective of what type of instrumentation is used or what technique is followed. This may result in (1) inadequately cleaned root canals, which can harbor debris and residual microorganisms, (2) an over-reduction of sound dentin with the possible outcome of reduced fracture resistance of the root, and (3) destruction of the integrity of the root, leading to an apical or strip perforation.

**Reviewer's Comments:** These issues can be greatly minimized by creating adequate access to the orifice, using precurved small stainless steel files to develop a glide path, and finishing the canal preparation with NiTi rotary instruments keeping to no greater than a 0.06 taper in larger canals and a 0.04 taper in other canals. (Reviewer-Gregori M. Kurtzman, DDS).

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Keywords: Canal Transportation

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## Third Molar Extraction Can Impact the TMJ Apparatus

*Incidence of Symptoms and Signs of TMD Following Third Molar Surgery: A Controlled, Prospective Study.*

Juhl GI, Jensen TS, et al:

J Oral Rehabil 2009; 36 (March): 199-209

Extraction of impacted wisdom teeth did not lead to a statistically significant increase in the postoperative diagnosis of temporomandibular disorders.

**Objective:** To determine if third molar extraction is associated with the development of symptoms and signs of temporomandibular disorders (TMD) up to 6 months postoperatively.

**Methods:** The Research Diagnostic Criteria for TMD (RDC/TMD) is a reliable standardized method for examination, diagnosis, and classification of the most common subtypes of TMD. These criteria were used to monitor the development of symptoms after third molar extractions. This study included 2 groups. The patient group included men and women older than 18 years of age who presented for the extraction of one impacted mandibular third molar with local anesthesia. The control group had the same criteria except they were not scheduled for third molar surgery. The TMJ exam included range of motion, muscle tenderness on palpation, and joint sounds (click or crepitation). The surgery was performed by experienced oral surgeons and included buccal flap elevation with buccal and distal trough creation. Bite blocks were used in all cases. The patients were administered ibuprofen for pain control.

**Results:** The range of motion was significantly reduced from 52 mm to 37 mm at 1 week after extraction but returned to normal within 6 months. Coarse crepitus (an indication of osteoarthritis) was significantly increased 6 months after surgery in the patient group, but no significant differences were seen for clicking sounds. Pain to the muscles of mastication (temporalis and masseter muscles) was significantly increased in the patient group, even at 6 months postoperatively. In contrast, the control group showed no significant differences over the 6-month follow-up. TMD was found in 15% of the patients and 8% of the controls at baseline. This increased to 21% for patients and 16% for the control group by 6 months.

**Conclusions:** There was no statistically significant increase in TMD in the experimental versus control groups. However, the patient group did show solitary signs and symptoms during and up to the 6-month follow-up. This included pain in the TMJ and muscles on palpation and increased joint sounds for up to 6 months after third molar surgery.

**Reviewer's Comments:** This study was unable to demonstrate a statistically significant increase in TMD diagnosis postoperatively. However, it was able to demonstrate that third molar extractions, even though considered minor surgery, have a significant impact on the TMJ apparatus. In those patients who have a predisposition to TMD, third molar extraction can precipitate certain symptoms which may eventually lead to a diagnosis of TMD. (Reviewer-Ryaz Ansari, DDS).

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Keywords: TMD & Molar Extraction

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## Advances in Magnets Offer Denture Retention Alternatives

*Mechanical Properties of Magnetic Attachments for Removable Protheses on Teeth and Implants.*

Boeckler AF, Morton D, et al:

J Prosthodont 2008; 17 (December): 607-615

The recently improved magnets seem to offer another method for denture retention, especially for those patients in whom there is little available vertical space.

**Background:** Magnets have been in use in dentistry in many different modalities. For removable prosthetics, they are primarily used for retention and stabilization. Although magnets are easily available and easy to use, there are complications associated with their use. These complications include items such as low magnetic forces, corrosion, and difficulties in prosthesis fabrication. Therefore, including magnets in prosthetic construction has been marginally successful. Technology has recently produced new types of magnets that are smaller and more retentive. Combination alloys of samarium-cobalt and neodym-iron-boron magnets are great enhancements. These magnets make magnetic retention using natural teeth to contain and support the components a more viable option. These magnets are contained in the prosthesis. Keepers are placed in the natural teeth or implants. Keepers are individually cast post and root cap components with magnetizable discs. The keepers do not produce a magnetic field. The diameters of the magnet and keeper are equal. Magnetic systems are open or closed. In a closed system, the magnets are in contact with each other. In an open system, the components are close but not in contact. These improvements give magnetic retention more applications in prosthodontics. The retention forces range from 4 N to 10 N. These forces ensure retention without damaging surrounding tissues. Interestingly, with continued use, the retentive forces of magnetic retainers are not reduced by cyclic pull-on and pull-off usage like that seen with standard precision attachments.

**Objective:** To compare pull-off forces and characteristics of magnetic attachments used on retained teeth and on dental implants.

**Methods:** 12 magnetic retainers for teeth and 12 for implants were tested in vitro. The magnet keepers were cemented to an implant lab analog or a base plate. A device was made to compare various brands and magnetic alloys and to compare open versus closed systems.

**Results/Conclusions:** When the magnets were 2 mm apart, there was no appreciable retention. The most retentive system was a closed system with a neodym-iron-boron magnet, which had a retention force of about 6.6 N. But the other systems were not much less retentive.

**Reviewer's Comments:** The differences among the magnet systems did not appear to be major, but the sample sizes were very small. The recently improved magnets seem to offer another method for denture retention, especially for those patients where there is little available vertical space. (Reviewer-Dennis Flanagan, DDS).

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Keywords: Removable Protheses

Print Tag: Refer to original journal article

## Cannabis Use Not Linked to Periodontitis in Adolescents

*Cannabis Use and Destructive Periodontal Diseases Among Adolescents.*

Lopez R, Baelum V:

J Clin Periodontol 2009; 36 (March): 185-189

There is no direct connection with cannabis use and periodontitis in adolescents from Chile.

**Objective:** To determine any connection between cannabis use and destructive periodontal disease among adolescents.

**Participants:** 9,200 high school students from the province of Santiago, Chile.

**Methods:** To determine the presence of periodontal disease, either necrotizing ulcerative gingival (NUG) lesions or clinical attachment loss (CAL)  $\geq 3$  mm had to be present. The cannabis exposure variables included "ever used" or "used regularly."

**Results:** For adolescents in Chile who "ever used" cannabis, a significant negative association to the presence of NUG lesions was found for nonsmokers only. The authors speculated that this negative association may be related to unknown confounders or different combustion products or possibly to exposure to biological mediators, being the cannabinoids of the cannabis plant. There is an emerging body of evidence that cannabinoids have potent immunomodulatory and anti-inflammatory effects that are relevant for several inflammatory diseases. The results of several studies have demonstrated these effects on human immune cells, as well as down-regulation of free radicals via promotion of an anti-inflammatory Th2 immune cytokine profile. However, these effects on Th2 production are present at low doses of cannabinoids but tend to shift away from Th2 to Th1 production at higher doses. Therefore, caution should be observed until proper dose-response relationships are established. **Conclusion:** There is no evidence in this study that cannabis use is positively associated with periodontal disease in this adolescent population. There is definitely a need for additional study.

**Reviewer's Comments:** A recent article by Thomson et al (*JAMA* 2008;299:525-531) reported a link between cannabis use and periodontal disease that was independent of tobacco use. The present study attempts to assess the same subject in adolescents. However, the present study differs from the study published in the 2008 *JAMA* article: the present study was of a younger population with shorter exposure while the Thomson study conducted in New Zealand evaluated a different age group with longer exposure and possibly differing health and oral hygiene habits. When we see a smoker with NUG-type symptoms, we should extend our discussion with the patient beyond smoking cessation to include a discussion about cannabis. (Reviewer- Ralph J. Bozza, DDS).

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Keywords: Cannabis-Associated Diseases

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## Etiology of MIH Explored

*Aetiology of Molar-Incisor Hypomineralization: A Critical Review.*

Crombie F, Manton D, Kilpartrick N:

Int J Paediatr Dent 2009; 19 (March): 73-83

Although there are many potential causative factors for MIH, some possible links include PCB/dioxin exposure, malnutrition, medical conditions, and heredity.

**Objective:** To determine the etiology of molar-incisor hypomineralization (MIH).

**Methods:** The authors reviewed 1,123 articles and selected 53 seeking the etiology of MIH. The level and quality of evidence was assessed for each article using Australian national guidelines.

**Results:** Dental enamel formation has ectodermal origin, and once formed, there is no longer metabolic activity. Therefore, disturbances to the enamel matrix secretory phase of amelogenesis are manifest as quantitative or morphologic defects (hypoplasia). Later disruptions to the calcification or maturation process produce morphologically normal but structurally or qualitatively defective (hypomineralized or hypomatured) enamel. The term MIH refers to demarcated, qualitative defects of enamel with systemic origin that affect one or more permanent molars, with or without incisor involvement. The results of MIH are not chronological in expression (unlike tetracycline staining or linear enamel hypoplasia) and are unlike the congenital condition of amelogenesis imperfecta. Current restorative management techniques are not very effective. There are many names for the demarcation of enamel, and the lesions can be clearly demarcated or diffuse. The first possible cause of MIH is exposure to polychlorinated biphenyls (PCBs) and dioxins. One study connected dioxin use and duration of breastfeeding on defect prevalence. Studies in developing nations connected breastfeeding to a protective effect on enamel formation, but early cessation of breastfeeding and malnutrition led to an increase of defects. The second possible cause of MIH is prenatal, perinatal, and neonatal problems. Although defects occur in the primary dentition, no clear links to MIH are known. Another possible cause is fluoride intake. Although fluoride exposure is related to diffuse defects, it does not appear connected to the clearly demarcated lesions of MIH. A fourth possible cause of MIH is common childhood illnesses. There may be a connection between respiratory problems, otitis media, high fever, urinary tract infections, and antibiotic use, yet studies have not shown definitive connections. A fifth possible cause for MIH is being medically compromised. Patients with celiac disease, cystic fibrosis, and renal disease have a higher incidence of enamel defects, but studies have weak evidence of a link to MIH.

**Reviewer's Comments:** Parents often question the cause of any non-uniformity in the appearance of the enamel on their child's incisors, and we see varying patterns and colorations and imperfections of permanent incisors and molars. Recent evidence suggests that ameloblasts are highly susceptible to relatively minor changes in their environment, including temperature increases, hypocalcemia, and pH levels. Genetics, issues in early development, early childhood illnesses, and antibiotic use may be implicated in MIH. (Reviewer-Ralph J. Bozza, DDS).

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Keywords: Molar-Incisor Hypomineralization

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## Three Materials Acceptable for Primary Molar Restorations

*A Randomized Trial of Resin-Based Restorations in Class I and Class II Beveled Preparations in Primary Molars: 24-Month Results.*

Dos Santos MP, Passos M, et al:

J Am Dent Assoc 2009; 140 (February): 156-166

Compared to Vitremer and Freedom, TPH Spectrum showed better marginal integrity and maintenance of anatomical form at 24 months after restoring primary molars.

**Background:** In pediatric dentistry, resin-modified glass ionomer cements (RMGICs), polyacid-modified resin-based composites (PMRBCs), and resin-based composites (RBCs) have been proven to be suitable restorative materials for primary molar restoration because of advantages and physical properties. Unlike the preparation for restoration of permanent molars, where bevels would cause an increase in marginal fracture at points of occlusal contact or functional slides, a bevel for a primary molar restoration improves bond strength by altering the prismless layer prior to etching, which reduces marginal microleakage.

**Objective:** To determine the 24-month survival rates of various restorations in Class I and Class II bevelled preparations in primary molars.

**Design:** Randomized clinical trial.

**Methods:** 48 children (mean age, 5 years 9 months) received 141 restorations with the 3 material types represented by Vitremer™ (RMGIC), Freedom™ (PMRBC), and TPH® Spectrum™ (RBC).

**Results:** The authors found no difference among materials at 24 months, but all 3 materials showed higher survival rates in Class I than in Class II beveled preparations. Cavity preparations were kept as conservative as possible without mechanical retention, and all margins were kept supragingival, with bevels on the occlusal and occlusal-proximal cavosurface margins. One observation of this study was that a small group of children accounted for most of the secondary carious lesions. TPH Spectrum showed better clinical performance in Class I restorations than did Vitremer at 12 months and at 18 months. TPH also proved superior to Freedom in Class II restorations at the 18-month recall. Also noted was a connection between marginal problems and caries, with marginal deterioration being a predictor of restoration failure due to secondary caries. There was no apparent advantage due to fluoride release by either Vitremer or Freedom. The reduction in success rates in Class II restorations was likely due to additional technical difficulties in placement.

**Reviewer's Comments:** In restoring primary molars, the 3 types of restorative materials (RMGIC, PMRBC, and RBC) are acceptable for Class I and Class II beveled preparations. However, in the current study, TPH Spectrum (an RBC) proved superior in marginal integrity and maintenance of anatomical form at 24 months. (Reviewer-Ralph J. Bozza, DDS).

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Keywords: Restorations in Primary Teeth

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## RFA Assesses Primary Implant Stability

*Reliability and Validity of the Instrumental Assessment of Implant Stability in Dry Human Mandibles.*

Brouwers JE, Lobbezoo F, et al:

J Oral Rehabil 2009; 36 (April): 279-283

For implants placed in dry cadaver bone, primary implant stability can be assessed by resonance frequency analysis measurements.

**Background:** Primary implant stability has been identified as a predictor for, and even a prerequisite to, achieving full osseointegration for both 2-stage surgery and for immediate loading of implants. In the past, 2 methods were proposed to assess primary implant stability - Periotest and insertion torque measurements. Periotest is a noninvasive technique, but its reliability is poor. Insertion torque measurements can only be made during implant placement. Resonance frequency analysis (RFA) is noninvasive and easy to perform. The implant stability quotient (ISQ; the outcome variable of RFA) is found by connecting the Osstell™ transducer to the implant to measure bone-implant stiffness, which corresponds to the level of integration stability. The Osstell RFA inventors have been the source of most of the literature on RFA.

**Objective:** To determine the reliability and validity of RFA of 2 types of dental implants placed in dry human cadaver mandibles.

**Methods:** 16 tapered and 16 cylindrical implants were placed in 8 dry unfixed mandibles to gather information about RFA. The ISQ and peak removal torque were determined.

**Results/Conclusions:** The intraobserver and interobserver reliability of RFA measurements relative to implant stability were fair to good, but the concurrent validity between RFA measurement and removal torque is poor.

**Reviewer's Comments:** Because this study took place on dry cadaver mandibles, there may not be a direct correlation to in vivo implant placement. Knowledge of primary implant stability is an extremely valuable quantity for determining implant success. However, in this study, the results demonstrated the following important points. (1) Primary implant stability can be assessed reliably with RFA measurement. (2) The validity between RFA measurement and removal torque does not exist. (3) Cylindrical implants appear more stable than tapered implants. (4) Two RFA measurements must differ by at least 9 ISQ units to be statistically significant. This differs from the owner's manual, which states that measurements should only differ by 2 ISQ units. A similar, large, in vivo study must be performed to determine if these results are reproducible in actual clinical practice. (Reviewer-Ralph J. Bozza, DDS).

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Keywords: Implant Stability Assessment

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## Anxious, Phobic Dental Patients Can Be Managed Successfully

### *Special Needs of Anxious and Phobic Dental Patients.*

Slovin M, Falagario-Wasserman J:

Dent Clin North Am 2009; 53 (April): 207-219

A multidimensional approach emphasizing behavioral, pharmacologic, and clinical dental factors is the most rational and effective means for meeting the personal needs of each individual patient.

Although modern dentistry has created a much more patient-friendly environment, patient anxiety owing to many sources has remained constant over the years. Severe anxiety leading to avoidance and dental neglect affects from 6% to 20 % of the population. Those with debilitating dental phobias have special needs that must be addressed before providing dental treatment. Among those presenting for dental care, nearly 50% present with some anxiety toward dental experiences. Those who are "casual avoiders" may frequently postpone needed dental treatment and, in the extreme, this may lead to serious dental breakdown with many additional health risks and quality-of-life concerns. A study by A. James (*Oral Health* 1997;87:9-14) showed that 25% of adults avoid dentistry because of childhood experience. Additionally, parents need to take precautions not to transfer their dental fear to their children. Fear is an individual's response to a real threat or danger, and it causes a physiological response. Anxiety is synonymous with fear except that the threat is ill-defined, subjective, anticipatory, and often associated with the unknown or ambiguous. Anxiety can be of benefit in many life situations unless it progresses to phobia. Phobia is an overwhelming, irrational feeling of fear which causes one to avoid the threatening stimulus at all costs. Phobia is learned through aversive situations, and this fear consists of feelings and thoughts that are often expressed through avoidance behavior. Observation of the patient throughout the office experience and questionnaires can provide information to the clinician and staff. The phobic patient exhibits a perceived loss of control leading to "white knuckle syndrome," "deer in the headlights" appearance, and a trove of additional responses to any of the sights or sounds of the dental office. An empathetic staff must be willing to investigate the patient's feelings and history using questions such as, "What might a dentist do to make you more comfortable?" or "What might a dentist do that would make you uncomfortable?" This may allow the patient to have input and some sense of control. Staff interactions that embarrass or provoke a dental patient can lead to many years of avoidance behavior. Proper training of all staff to be caring is indicated to welcome and relax these patients with special needs.

**Reviewer's Comments:** We have all encountered anxious and phobic dental patients, and our mutual interactions can influence the outcome of treatment and their long-term dental, emotional, and systemic health. This article provides (1) some tools to improve the interaction and reduce stress for both dental provider and patient and (2) several questionnaires, including the Corah Dental Anxiety Scale, the Kleinknecht Dental Fear Survey, and the Dental Beliefs Survey developed by Smith, Getz, et al. (Reviewer-Ralph J. Bozza, DDS).

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Keywords: Dental Phobia, Anxiety

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## Smoking Negatively Influences Periodontal Plastic Procedures

*The Influence of Tobacco Smoking on the Outcomes Achieved by Root-Coverage Procedures: A Systematic Review.*

Chambrone L, Chambrone D, et al:

J Am Dent Assoc 2009; 140 (March): 294-306

Smoking may negatively influence gingival recession reduction and clinical attachment gain.

**Background:** Gingival recession (GR) is the vertical displacement of the gingival margin on a tooth in an apical direction, which can lead to hypersensitivity, root abrasion, and esthetic concerns. Treatment of such defects has been termed periodontal plastic surgery and is accomplished by many techniques, including laterally repositioned flaps, coronally advanced flaps, free gingival grafts, subepithelial connective tissue grafts, acellular dermal matrix allografts, and guided tissue regeneration. These are used for treatment of Miller Class I and Class II recessions. These techniques are effective in reducing exposed root surfaces with increases in clinical attachment level and the width of keratinized tissue. The condition of the periodontium and these tissue parameters over time can be evaluated and compared with respect to certain conditions, such as tobacco use. The evidence is increasing for the negative effect of tobacco smoking on the outcome of periodontal plastic procedures. Tobacco smoking affects the oral environment and ecology, tissue vascularization, immune and inflammatory responses, and the healing potential of periodontal connective tissues. Smokers are 2 to 8 times more susceptible to periodontal disease than are nonsmokers, and they respond negatively to all periodontal treatments and exhibit a higher tooth loss rate during maintenance phases relative to nonsmokers.

**Objective:** To determine, through a literature search, if tobacco smoking causes negative effects on the results obtained through periodontal plastic surgery.

**Results:** A smoker's long-term healing response was affected by tobacco use. Smokers who received subepithelial connective tissue grafts for treatment of GR had fewer sites exhibiting complete root coverage than did nonsmokers.

**Reviewer's Comments:** This study's results put another nail in the coffin regarding the mixing of smoking and dental procedures involving the manipulation of the periodontium, including periodontal plastic procedures, implant placement, extraction, or bone grafting. Like oil and water, mixing periodontal treatment and smoking does not translate to a beneficial outcome for the periodontium. It is best if patients receiving periodontal plastic surgical procedures either discontinue smoking during the healing phase or, at the very least, reduce their smoking. (Reviewer-Ralph J. Bozza, DDS).

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Keywords: Smoking & Gingival Recession

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