Low-Dose RT of Jaws and Oral Bisphosphonate Use Can Lead to Osteonecrosis

A Compounded Diagnosis: Maxillary Osteochemonecrosis in the Setting of Low Dose Radiotherapy.


Periapical inflammatory disease and dental extractions can trigger osteonecrosis of the jaw in susceptible patients.

**Background:** Oral bisphosphonates are commonly prescribed to treat osteoporosis and have been associated with low risk of osteonecrosis of the jaw. This diagnosis is excluded if there is a history of radiation therapy to the jaw; however, some patients may present with both a history of oral bisphosphonate use and head and neck radiation, both of which have been associated with risk of osteonecrosis.

**Objective:** To present a case of osteonecrosis of the jaw associated with a history of low-dose radiotherapy to the maxilla and oral bisphosphonate use.

**Design/Methods:** This was a case report of a 68-year-old female who presented to a general dental clinic in March 2006 for evaluation of asymptomatic, deeply carious teeth in the left maxilla, which were extracted. She had a history of osteoporosis, hypertension, and non-Hodgkin's lymphoma of the nasal cavity and paranasal sinus. Left neck was treated with chemotherapy and low-dose (39.6 Gy) external beam radiation therapy to the nasal cavity and paranasal sinuses in 1998. She was taking alendronate 70 mg per week (for the past 10 years), atenolol, nifedipine, hydrochlorothiazide, and simvastatin.

**Results:** 2 months after the dental extractions, the patient presented with pain, exposed bone, and purulent discharge in the left maxilla. Superficial debridement of bony sequestra was performed by an oral and maxillofacial surgeon on multiple occasions; oral antibiotic therapy and chlorhexidine oral rinses were prescribed. The necrotic bone was cultured and viewed under a microscope, revealing colonization by Actinomyces. The patient's physician discontinued the alendronate. The left maxillary wound stabilized and was nearly completely covered by mucosa at follow-up 24 months later.

**Conclusions:** If similar cases are reported of patients who develop osteonecrosis of the jaw with a history of both head and neck radiotherapy and oral bisphosphonate use, perhaps the definition of osteochemonecrosis should be revised to not exclude patients who have had head and neck radiotherapy.

**Reviewer's Comments:** Preoperative periapical radiograph of the left maxilla showed ill-defined, "moth-eaten" radiolucency and destruction of bone around these carious teeth; therefore, the pre-existing periapical disease as well as the extractions may have contributed to the development of osteochemonecrosis in this patient, who had increased risk for poor wound healing from both radiotherapy to the jaw and long-term oral bisphosphonate use.

**Additional Keywords:** AGD Code: 754

**print tag:** ( ) Refer to original journal article.
Impacted Third Molars Increase Risk of Mandibular Angle Fractures

A Study on the Impact of Mandibular Third Molars on Angle Fractures.
Subhashraj K:
J Oral Maxillofac Surg; 67 (May): 968-972

This study confirms an increased risk of angle fractures in the presence of a lower third molar, as well as a variable risk for angle fracture, depending on the third molar's position.

Background: The presence of impacted third molars has been reported to be associated with an increased risk of fracture of the mandible. The exact role of third molars and their degree of impaction and position in the jaw on the risk of fracture of the mandibular angle is not known.

Objective: To systematically determine the relationship between presence and severity of impacted third molars and the risk of mandibular angle fracture in patients with mandibular fractures.

Design/Methods: This was a retrospective chart review of all patients who presented with mandibular fracture at a single oral and maxillofacial surgery department in India between January 1996 and December 2005. From the records and radiographs, the following data were recorded: fracture site; third molars absent/present; and if present, angulation, depth, and relationship of third molar to mandibular ramus. Age, gender, and cause of injury were also recorded. Data were analyzed using the chi-square test.

Results: 2033 patients had 3142 mandibular fractures. In total, 72.0% of patients had a third molar present, and 26.5% had an angle fracture. The most frequent cause of injury was road traffic accident (64%) followed by assault (19%) and falls (12%). Patients with angle fractures were younger than patients without angle fractures ($P < 0.001$); males had more angle fractures than females ($P < 0.001$); and road traffic accidents were the most common cause ($P < 0.001$). Patients with third molars were 2.62 times more likely to have an angle fracture than patients without third molars. A total of 77.7% of patients with unerupted third molars had an angle fracture. Unerupted third molars, positioned at or below the occlusal plane of the adjacent second molar, and location within the ramus had a higher risk of angle fracture. The risk for an angle fracture of vertically impacted third molars was greater than other angulations ($P < 0.001$).

Conclusions: The risk of mandibular angle fracture was greater when third molars were present. Risk was greatest for third molars that were completely, vertically impacted and located within the ramus.

Reviewer's Comments: The large sample size was a strength of this study. Limitations include its retrospective cross-sectional design and potential bias of classification of third molar position/status by an observer knowing the site of the fracture. It not yet known which patients would most benefit from prophylactic extraction of third molars, but all should be informed of the risk associated with impacted third molars and mandibular angle fracture when making treatment decisions.

Additional Keywords: AGD Code: 498

print tag: () Refer to original journal article.
Teeth With Lost or FS Have No Higher Caries Risk Than NS Teeth

Caries Risk in Formerly Sealed Teeth.

There is not an increased caries risk in teeth that have lost or partially lost sealants compared to never-sealed teeth.

Background: Dental caries are present in as many as 70% of late adolescents. Low-income children have a caries rate double that of higher income children. Ninety percent of carious lesions are seen in the pits and fissures of the posterior dentition. Overall caries incidence in sealed teeth is 60%. It is stated that teeth that have completely retained sealants are 100% effective and thus the efficacy is related to the retention of the sealant.

Objective: To present information that justifies the continuance and expansion of school programs providing dental sealants. One concern would be that lost or partially lost sealants put the tooth at greater risk than if it had never been sealed.

Design/Methods: This article is a compiled review of past studies on this topic. Fifteen years of studies were evaluated with various inclusion criteria. The most important criteria were a randomized controlled split-mouth designed study. Subject ages were 5 to 14 years. Failed sealants (FS) were defined as those that were missing or partially missing. Subjects were followed over a 4-year interval.

Results: Caries incidence in never-sealed (NS) teeth varied from 24% to 47%. The mean sealant retention rate at 4 years was 51%. A comparison of the NS caries rate with the caries rate in the FS group showed no statistically significant variance at the 95% confidence interval.

Conclusions: Individual teeth with lost or failed sealants show no higher incidence of caries than never sealed teeth. The majority of FS teeth were teeth with partially retained sealants. It is stated that concern of increased caries risk in partially retained sealants may be unfounded. When the stated 100% reduction rate of caries prevention is figured in, the overall benefit to children who have sealants placed far outweighs any concern of increased caries in FS teeth. This indicates that there is no disadvantage to sealing teeth even when no follow-up can be assured. The authors feel that children in school programs should not be excluded from sealant placement because they cannot be assured of follow-up evaluations over time.

Reviewer’s Comments: While the results stated do not completely support this reviewer’s anecdotal experiences, the statistics strongly suggest that sealants are an effective and appropriate treatment for at-risk children. Certainly a more detailed study design could be done in a prospective study with the latest generation of sealant materials, and scoring of the severity of caries in FS and NS teeth could be analyzed.

Additional Keywords: AGD Code: 257

print tag: () Refer to original journal article.
New Technology Allows You to Provide Upgraded Oral Cancer Detection Services

A Life-Saving Practice-Builder.

Lackey AD;
Dent Econ; 99 (April): 82-84

Discussion: Dr Arlen Lackey summarizes emerging dental technologies that are available for early cancer detection in the oral tissues. Never has there been a more life-threatening dental issue than oral cancer. Traditionally, dental exams contain a digital/tactile and visual examination of the oral tissues. There are now products and techniques that allow us to upgrade our abilities to locate and diagnose tissue changes such as dysplasia and carcinoma much earlier than with the traditional dental exam. As a group, the dental community can reduce the morbidity and mortality rates of our patients through early detection of oral cancer. The author has a team-based approach to utilization of products such as Oral CDxBrushTest, Zila ViziLite Plus, LED Dental VELscope, and Trimira Identafi™ 3000. There are technique-specific training materials available for each product, which should be embraced by the entire dental team. The hygienist should take the lead in presenting the merits of the upgraded examination to patients. It is recommended that the first evaluation be at no additional charge to the patient and then an annual fee be charged thereafter. The author feels that patients will accept and appreciate the assurance that they are cancer free and be willing to pay an appropriate fee for this upgraded service. It was even suggested that for the next visit, any patient who declines the service should be given the examination free as a demonstration of the dental office's commitment to the patient's well being. The patient is told that they have always been screened for oral cancers, but that with the new technology possible problems that are not palpable or visible can be detected and treated early before they are spread. A written information sheet accompanies the exam and findings are noted. A 12-month review indicated that 1% of patients seen in the author's practice had some type of precancerous condition and that 2 squamous cell carcinomas were detected. To these 2 patients, this potentially was a life-saving experience. The author recommends that anything resembling a traumatic lesion in nature be revisited and tested in 2 to 3 weeks to confirm the differential diagnosis. In this reviewer's opinion, enhanced oral cancer examinations should become the standard of care when they are statistically validated over time.

Reviewer's Comments: This is a summary article that briefly reviews the available products for doing an upgraded oral cancer examination. The article is more motivational than descriptive and points out the serious consequences of failing to detect oral cancer in its earliest stage.

Additional Keywords: AGD Code: 552

print tag: () Refer to original journal article.
Dentists Screening for SDB May Prolong, Improve Patient's Quality of Life

The Potentially Harmful Medical Consequences of Untreated Sleep-Disordered Breathing: The Evidence Supporting Brain Damage.

Simmons MS, Clark GT:
J Am Dent Assoc; 140 (May): 536-542

Dentists are in the unique position of being able to screen for and recognize SDB because of our continuing recare programs.

**Background:** The most common sleep disorders are sleep-disordered breathing (SDB) and insomnia. Obstructive sleep apnea (OSA) is a type of sleep-disordered breathing. One in 6 Americans aged 30 to 69 years have at least mild OSA which may be unrecognized 90% of the time.

**Objective:** To determine the validity of evidence supporting SDB and episodic hypoxia (EH) as causes of brain injury and permanent loss of certain cognitive abilities.

**Design:** Literature review.

**Methods:** Papers reviewed included evaluation of human sleep and brain anatomy and animal studies in which EH events were modeled and stimulated both in the adult and animal pup stage.

**Results:** Hypoxia caused by near drowning or asphyxiation leads to brain injury. The question is whether lesser hypoxic events such as EH can cause the same type of brain damage. Evidence for this is becoming convincing. In one study, rat models were subjected to recurring decreases in oxygen levels that would mimic an OSA condition. After 2 weeks, persistent decreased performance was observed. The study showed deficits in rat pups, suggesting exposure at an early age might possibly correlate to the studies which show pediatric OSA being associated with hyperactivity and attention deficit. Human studies comparing brain morphology with MRI showed significant differences between subjects diagnosed with OSA and normal controls. One study found that children with severe OSA had lower IQ scores and verbal functioning abilities. Another showed that even less severe forms of OSA resulted in significant differences in memory and intellectual ability in 5-year-olds.

**Interventions:** The use of continuous positive airway pressure and mandibular advancement devices were evaluated as forms of therapy. Both showed beneficial improvement in specific areas.

**Conclusions:** EH seen in SDB indeed causes damage to the brain and results in alteration of higher cognitive abilities, mood, and executive functions. This appears to be retained throughout life and can start early in childhood. It is stated that dentists, because of our frequent recare evaluations, are in a special position to screen for and refer for definitive diagnosis patients with SDB.

**Reviewer's Comments:** This is a very informative article pinpointing the importance of early recognition of SDB. When one considers that the preponderance of evidence reviewed indicates that permanent changes do occur and occur at an early age with potentially catastrophic cardiovascular, metabolic, and systemic complications, this becomes a must-read article.

**Additional Keywords:** AGD Code: 160

**print tag:** () Refer to original journal article.
Tooth Whitening and Orange Juice-What's the Difference?

Effects of Tooth Whitening and Orange Juice on Surface Properties of Dental Enamel.

Ren YF, Amin A, Malmstrom H:
J Dent; 37 (June): 424-431

Tooth whitening has shown no deleterious effect on enamel.

**Background:** The effect of tooth whitening on enamel is a legitimate concern among dentists and consumers alike. Researchers have conducted several studies looking at whether tooth whitening reduces or causes deleterious effects on enamel; these have produced equivocal results.

**Objective:** To determine the effect of whitening gel compared to orange juice on human enamel.

**Methods:** Baseline surface roughness analysis and microhardness was measured on enamel specimens and placed in human saliva to allow formation of a pellicle before treatment with either 6% hydrogen peroxide whitening gel, orange juice, or a saline control for 20 minutes per day for a total of 5 days. Surface microhardness and roughness measurements were taken after treatment in the 3 study groups and mean changes relative to baseline values were calculated.

**Results:** The before and after mean treatment values showed an 84% decrease in enamel hardness for the orange juice group and also significantly altered the enamel surface topography for 3 roughness parameters (Sa, Sz, and Sdr) measured. No significant changes in microhardness or surface roughness were observed for the whitening gel or water control groups.

**Conclusions:** The results of this study showed that treatment with 6% hydrogen peroxide had no significant effect on enamel surfaces, while orange juice showed a significant increase in surface roughness and a reduction in enamel surface hardness.

**Reviewer's Comments:** This study contributes to the literature by demonstrating the harmful effects of orange juice on enamel, but we have to keep in mind that the long orange juice exposure times are not clinically relevant. For the bleaching exposure time, the opposite is true; it would have been better to see longer treatment times with the whitening gel. A relatively short treatment time such as 20 minutes per day for 5 days provides limited information. A 6-month vital bleach study (Haywood VB, et al, 1997) provides strong evidence for bleaching safety in dentistry.

**Additional Keywords:** AGD Code: 781

**print tag:** () Refer to original journal article.
Immediate Dentin Sealing Improves Dentin Bond Strength of Resin Inlays

The Effect of Three Variables on Shear Bond Strength When Luting a Resin Inlay to Dentin.

Lee JI, Park SH: Oper Dent; 34 (May-June): 288-292

Sealing dentin immediately before taking the impression for an indirect resin inlay improves dentin bond strength.

**Background:** Bonding to dentin involves several variables that can determine the success of an indirect resin inlay. Factors to consider include the amount of air pressure used to thin the adhesive, when to cure the adhesive (before or after cementation), and whether sealing of dentin before taking the impression is beneficial.

**Objective:** To investigate the effects of forceful versus gentle air-thinning of adhesive--precure versus postcure--and immediate dentin sealing on the bond strength of indirect composite to dentin.

**Methods:** 90 human premolars were sectioned to fabricate dentin disc specimens and were randomly divided into 6 groups: 3 immediate dentin sealing (IDS) groups and 3 non-IDS groups. Following dentin preparation, self-etch adhesive was applied according to the manufacturers' instructions to seal the dentin before taking the impression for the 3 IDS groups (groups 1-3). For the non-IDS groups (groups 4-6), no adhesive was applied. Polyvinyl impression material was applied to all specimens for 5 minutes and removed, followed by simulated temporization with a resin-based provisional material (Fermit). After 5 days, 2 indirect composite cylinders (Tescera) were bonded on each specimen using light-cure composite (Z250) or dual-cure resin cement (Duo-link) as follows: for groups 1 and 2, the self-etch adhesive (AdheSE) was applied and thinned with gentle air or forceful air, respectively, and then precured before cementation; in group 3, the adhesive was thinned with forceful air and was not light-cured before cementation. The same adhesive protocols were repeated for the non-IDS groups--groups 4 and 5 precured with gentle and forceful air thinning, respectively, and group 6 applied with forceful air using the postcure technique. All specimens were subjected to shear bond testing.

**Results:** The shear bond testing showed improved strength when the dentin was immediately sealed with self-etch adhesive. The highest of all groups was the IDS group bonded with gentle air thinning and precuring of the adhesive. Generally, there was no difference between luting materials, Z250 or Duo-link.

**Conclusions:** The results of this study showed the highest bond strength to indirect composite when dentin was sealed before impression taking and the self-etch adhesive was thinned with gentle air and light cured before cementation.

**Reviewer's Comments:** This study is a nice follow-up to the work done by Pascal Magne in 2005, demonstrating that immediate dentin sealing improves bond strength of indirect restorations. Caution should be advised regarding the use of light cure restorative composite for bonding deep indirect restorations. In the current study, curing was performed through cylinders of composite 3-mm in height, while a real clinical situation will have surrounding tooth structure absorbing light energy and often deeper dimensions at interproximal gingival margins. Dual-cure resin cements are still the standard.

**Additional Keywords:** AGD Code: 017

**print tag:** () Refer to original journal article.
Ceramic Roughness Creates Wear on Opposing Teeth and Nanofilled Composites

The Influence of Antagonistic Surface Roughness on the Wear of Human Enamel and Nanofilled Composite Resin Artificial Teeth.

Ghazal M, Kern M:
J Prosthet Dent; 101 (May): 342-349

Ceramic restorations should be polished as much as possible to prevent deleterious wearing of the opposing enamel or composite resin.

**Background:** Frequently, minor adjustments are needed when fitting ceramic restorations prior to their cementation. The use of rotary instruments on the highly polished and glazed surfaces results in roughness. These roughened areas need to be minimized, if not eliminated, by the dentist in order to prevent excessive wear of enamel or composite during occlusal contact.

**Objective:** To study the relationship between the wearing down of enamel and nanofilled composite resin and the surface roughness of opposing ceramic material.

**Methods:** This experiment was performed in vitro in order to analyze the wear resistance of human enamel and nanofilled composite resin teeth. Three sets of 16 zirconia ceramic balls, each with different amounts of surface roughness, were tested against 3 groups each of 8 human teeth (enamel) and 3 groups of 8 nanofilled composite resin teeth. The wear tests were performed in a mastication simulator with the zirconia balls of varying roughness contacting the human teeth and the nanofilled composite. A laser scanner measured volume loss and vertical substance loss (depth of wear). Statistical data were recorded measuring the relationship between opposing ceramic surface roughness against the teeth and nanofilled composite.

**Results:** A significant increase in the wearing of human enamel and composite resin occurred as the roughness of the opposing ceramic increased. The enamel showed less wear than the nanofilled composite resin. Eliminating surface roughness has other clinical implications. An irregular surface results in increased retention of plaque, intraoral irritation, and possibly a decrease in esthetics. The ceramic roughness should be highly polished before cementing any restoration.

**Conclusions:** Irregular, roughened ceramics will wear human enamel and nanofilled composite restorations at a different rate. After adjusting any ceramic restoration, it must be highly polished.

**Reviewer's Comments:** This study comprehensively discusses the effects of inadequately polished ceramic restorations on opposing teeth and composite. Before insertion, restorations frequently need to be adjusted chairside once they have been returned from the dental laboratory. Several types of polishing wheels and brushes are available that the dentist may use to restore a smooth surface and high luster to the restoration. This study was performed outside the mouth. It would be good to see a clinical in vivo study to further evaluate the wearing of the materials in that setting. A study using other clinically accepted materials (ie, glass or ceramic) also would be useful.

**Additional Keywords:** AGD Code: 255

**print tag:** () Refer to original journal article.
Electric Handpieces Are Good Alternative to Air-Turbine Handpieces

In Vitro Comparison of the Cutting Efficiency and Temperature Production of Ten Different Rotary Cutting Instruments. Part II: Electric Handpiece and Comparison With Turbine.


Maximum cutting efficiency may be achieved by using an electric handpiece with a carbide bur rather than using an air-driven turbine handpiece.

Background/Objective: The dental rotary cutting instruments, carbide and diamond burs, are routinely used for tooth reduction in both electric and air-turbine handpieces in the dental office. In this study, the performance of these types of burs in each of these handpieces is evaluated.

Methods: 10 groups of burs were chosen, 9 diamond and 1 carbide. The specimens were Macor blocks, and cuts were made in each with the different types of burs, as well as using both air-turbine and electric handpieces. Among the variables measured were temperature, rate of advancement, applied load, revolutions per minute, and energy needed to cut the substrate. The performance of the rotary instruments on each type of handpiece was analyzed. The electric handpieces were used at a speed of 200,000 revolutions per minute (rpm); the air-turbine was set at 400,000 rpm. However, the rotational rate of the air-turbine handpiece markedly decreases as the applied load increases. The electric handpiece produces significantly less aerosol but also is more expensive and weighs between 50% and 100% more than the air-turbine.

Results/Conclusions: Both carbide and diamond rotary cutting instruments showed lowered pulpal temperatures when the electric handpiece was used. Higher rates of advancement and applied load were achieved with the electric handpiece. The cutting efficiency of carbide burs was superior to that of diamonds, and when used in an electric handpiece, greater amounts of substrate per unit time were removed than with the air-turbine. Overall, the higher cutting efficiency of the electric handpiece is most likely due to its greater torque, especially when a carbide bur is used.

Reviewer's Comments: This study presents an extraordinary amount of data, but the important conclusion is plain—electric handpieces have greater cutting efficiency than air-turbine handpieces. In addition, it was demonstrated that carbide rotary cutting instruments are superior to diamond burs in restorative procedures involving removal of tooth structure. Although the study was supported by a dental supply company (SS White), the results appear unbiased. Electric handpieces are increasing in acceptance and prevalence. This study provides a reassuring evaluation of their value in dental offices as an alternative to air-turbine handpieces.

Additional Keywords: AGD Code: 250

print tag: () Refer to original journal article.
General Dentists Need More Training for Use of MAAs for Sleep Apnea

Are General Practitioners Effective in the Management of Non-Apnoeic Snoring Using Mandibular Advancement Appliances?

Church SKJ, Littlewood SJ, et al:
Br Dent J; 206 (April): 1-7

There is more to treating snoring than making upper and lower impressions, and this service should be undertaken only after appropriate training.

Background: For several years, the management of snoring and sleep apnea has been of interest to general dentists, primarily through the fabrication of mandibular advancement appliances (MAA), which favor airway opening while the patient sleeps, theoretically preventing snoring.

Objective: To identify the success rate of general dentists who treated non-apneic snoring in their patients using a mandibular-advancement appliance after a short period of training (ie, 1 day).

Design: The study was prospective, and the researchers invited 258 general dentists without prior training in the treatment of snoring or other sleep disorders to participate. Patient subjects were recruited from 3 hospital-based dental clinics.

Participants: 15 dentists and 46 to 60 patients, who met most or all inclusion criteria, including being over the age of 18 years, in good health, and previously diagnosed with simple, or non-apneic, snoring, were enlisted. The sleep partners of the subjects were also enrolled.

Methods: The dentists were provided with a 1-day course on MAA fabrication and clinical use, and then they participated in a 2-hour clinical experience session using another dentist as a simulated patient. The clinical exercise was done until each dentist felt adequately proficient to deliver an appliance to a patient with non-apneic snoring. The success of the therapy was assessed using the Epworth sleepiness scale (ESS) and outcome questionnaires completed by both the patient and their sleep partner.

Results: 48 subjects completed all parts of the study. Only 48% of the subjects' sleep partners rated the appliance therapy as successful after a 3-month monitoring period. There was a small average reduction of ESS scores from a median of 9.0 down to 7.5, and the most frequently observed adverse effect of the appliances, as assessed by patients, was tooth and gum pain (22% incidence).

Conclusions: The authors concluded that the effective use of mandibular advancement appliances by general dentists requires more extensive training than that available in a 1-day course, particularly in the area of the requisite protrusive bite registrations.

Reviewer’s Comments: The ability to treat snoring with relatively simple, removable appliances is an attractive practice-building service to offer in a general dental practice. However, it is clear from the research that the requisite skill cannot be learned in only 1 day.

Additional Keywords: AGD Code: 160

print tag: () Refer to original journal article.
Residual Tooth Structure Is Most Critical Factor in Fx Resistance

The Effect of Fiber Dowel Heights in Resin Composite Cores on Restoration Failures of Endodontically Treated Teeth.

When using fiber posts, make the coronal length as long as possible.

**Background:** When restoring single-rooted teeth that have been endodontically treated, the placement of a retentive post indicates concern for root fracture following the placement of a definitive restoration.

**Objective:** To assess the effect of variations in the coronal height of fiber posts in endodontically treated teeth.

**Design:** This study was performed in vitro on extracted teeth, all of which were treated endodontically in an identical manner and restored with composite cores and fiber posts of varying coronal height.

**Methods:** The authors used 40 extracted maxillary central incisor teeth that were free of identifiable defects and were treated with conventional endodontic therapy. All teeth were prepared for all-ceramic crowns using 1.5-mm shoulder margins and a 2-mm ferrule. Teeth were divided into 5 groups. One group was treated by removing gutta percha 2 mm below the CEJ and then filled with a dual-cure composite. In a second group, 8 mm of gutta percha was removed, and an 18-mm quartz fiber post was placed with a composite resin. In the remaining 3 groups, coronal tooth structure was removed to within 1 mm of the CEJ, and 10 mm of gutta percha were removed. They were restored with fiber posts of 14-, 16-, or 18-mm lengths, and the cores were built up with composite. In these 3 groups, this resulted in posts that were 2, 4, or 6 mm above the coronal tooth structure, embedded within composite build-ups. Ceramic crowns (IPS Empress) were bonded to all teeth, after which they were subjected to a load at 130 degrees to their long axis until fracture occurred.

**Results:** The highest fracture resistance occurred in the teeth with no composite core and an 8-mm coronal post height, significantly greater than the groups with resin core build-ups. In those with build-ups, the teeth with the longest (6 mm) supracoronal length were the most resistant to fracture.

**Conclusions:** Residual tooth structure was the most critical factor in fracture resistance, and posts with the longest possible coronal height should be used.

**Reviewer’s Comments:** While this is an in vitro study, it supports the clinical observation that natural tooth structure in combination with an adequate ferrule gives the most predictable restorative outcomes in endodontically treated anterior teeth.

**Additional Keywords:** AGD Code: 070

**print tag:** () Refer to original journal article.
Rubber dams alone do not prevent endodontic failures. The clinician must adopt many other procedures to prevent leakage and ensure high endodontic success rates.

Background: Advancements in endodontic technique continue to facilitate success rates of >90%, but only when the clinician strictly observes all fundamental steps in this important therapy.

Objective: To review the literature regarding the techniques and innovations in endodontic therapy.

Methods: The authors reviewed 8 critical procedural steps in endodontic therapy and assessed their importance based on scientific publications over variable periods of time and based on outcomes that produced optimal outcomes of healing and tooth survival. The procedures and factors reviewed included prevention of coronal leakage, core buildups, endodontic re-treatments, air-water delivery in the operating field, rubber dam, use of calcium hydroxide as an intracanal medication, management of tooth discoloration, and methods of debridement and irrigation.

Results: In regard to the prevention of coronal leakage, the literature confirmed that coronal leakage is the major determinant of endodontic success or failure, and that leakage is most significant with temporary closure of the endodontic access opening or temporary cementation of provisional restorations. With regard to core buildups, glass ionomer restorative materials have the highest failure rate, and the use of both self-curing and dual-cured resins may also result in failures due to chemical incompatibilities. Endodontic retreatment is less predictable when posts and carrier-based obturation systems have been used. Conventional air-water syringe tips may compromise bonding in root canal systems due to the presence of residual water in the tip. Other factors in failures include leakage of rubber dams and incomplete removal of bacteria, especially in necrotic teeth.

Conclusions: The authors recommend several important ways to prevent endodontic failures, including immediate placement of final restorations, the use of composite resins and fiber posts, special irrigating tips for rinsing and drying root canal systems, use of clay/cellulose-based sealers around the cervical margins of teeth isolated with rubber dams, and placement of calcium hydroxide as far apically as possible to eliminate pathogenic bacteria. Finally, chemical debridement with sodium hypochlorite is reaffirmed as a standard agent for debridement.

Reviewer’s Comments: There should not be any surprises here with regard to the reasons for endodontic failures, but the article highlights some innovative solutions to old problems that promise to improve endodontic success rates. Notable among these is the increasing emphasis on resins to seal canal systems and secure posts, new delivery tips to ensure better placement of intracanal medications and debriding fluids, and the establishment of calcium hydroxide as a standard material in treating necrotic teeth.

Additional Keywords: AGD Code: 070

print tag: () Refer to original journal article.
Years on HD Associated With Increased Severity of Periodontal Disease

The Effect of the Duration of the Dialysis in Hemodialysis Patients on Dental and Periodontal Findings.

Cengiz MI, Smer P, et al:
Oral Dis; 15 (July): 336-341

Nondiabetic patients on HD have worse periodontal disease than normal, healthy patients that is increased with the duration on HD, especially after 10 years.

Background: Prevalence of chronic renal failure (CRF) and hemodialysis (HD) is increasing. CRF is a pro-inflammatory state and may increase the risk of periodontal disease (PD). Patients on HD may eventually receive transplants; it is important to know if HD increases the risk and severity of PD, which could be an obstacle to transplant.

Objective: To compare the dental and periodontal health of HD patients with healthy controls and to determine the effect of duration of HD on dental and periodontal health.

Methods: Patients with CRF undergoing HD at a dialysis center in Turkey (4 hours per day, 3 times per week) and normal healthy controls from a dental school participated in this study; diabetics were excluded. None of the participants had received periodontal/dental treatment within the past 6 months. All HD patients received the same medications. Decayed, missing, and filled teeth (DMFT) were recorded. The plaque index (PI) and gingival index (GI) for each tooth, as well as periodontal pocket depth (PPD) and loss of periodontal attachment (LPA) (6 sites per tooth) were recorded. Patients were grouped according to duration (in years) of HD: <1.0, 1.0 to 2.9, 3.0 to 4.9, 5.0 to 9.9, and >10.0. Dental/periodontal measures were compared for patients and controls, and the relationship between duration of HD and oral health was assessed.

Results: 68 patients with HD (37 males, 31 female; mean age, 47.85 years) and 41 healthy age- and sex-matched controls were studied; 25 patients and 15 controls were smokers. There was no significant difference between HD and controls for age, sex, smoking habits, or DMFT. PI, GI, LPA, and PPD were significantly higher in HD patients ($P<$0.01). There was no significant difference in DMFT between the 5 HD subgroups and healthy controls. Age was weakly correlated to LPA ($P<$0.05) but not to DMFT, PI, GI, and PPD ($P>$0.05). Time on HD was significantly correlated with PI, GI, LPA, and PPD ($P<$0.001) Periodontal disease measures were highest in patients on HD >10 years.

Conclusions: Patients on HD have poor periodontal health, which significantly worsens over time on HD, especially when time is >10 years.

Reviewer's Comments: This was a well-designed study. Plaque and measures of periodontal disease were worse in HD patients than controls and increased with duration of HD, especially after 10 years. Since periodontal disease is prevalent in this population and can cause systemic inflammation and infection, regular dental care is imperative to maintain health and eligibility for renal transplant.

Additional Keywords: AGD Code: 754

print tag: () Refer to original journal article.
Injured Domestic Violence Victims Want Dentists to Ask and Help

What Victims of Domestic Violence Need From the Dental Profession.
Nelms AP, Gutmann ME, et al:
J Dent Educ; 73 (April): 490-498

The lip is the most common site of injury to the head and neck from domestic violence.

Background: Domestic violence is very prevalent worldwide, including the United States. Dentists have an opportunity to provide assistance to victims who present with orofacial injuries, but few understand the relationship between injuries to the head and neck region and domestic violence and what victims want us to do for them.

Objective: To determine what domestic violence victims need from the dental profession when they visit a dental office with head/neck/mouth injury or other signs of abuse and how often those needs are met.

Methods: 15 copies of a 14-question survey were mailed to each of 15 domestic violence shelters in North Texas. Directors/counselors had clients complete the forms and return the survey during May and June of 2006. Descriptive statistics were calculated. Analysis of Variance (ANOVA) was performed to determine the association of age, race, marital status, and gender with abuse.

Results: 11 of the 15 shelters participated; the response rate was 67.8% (112 of 165 surveys). All subjects were female, 57.1% were Caucasian, 29.5% were African American, and 7.1% were Hispanic. Approximately 76% reported injury to the mouth, head, or neck from domestic violence. The most common site was the lip (29%). There was no correlation between age, race, marital status, and the likelihood of abuse involving the mouth, head, and neck. Of the 85 patients (out of 112) who had a head, neck or mouth injury, 14% had seen a dentist for the injury. Also, 52.9% had visited a dentist for dental care when signs of abuse were present; 86.6% of them said they were not asked about their injuries, and most (69.2%) would have liked someone to ask about their injuries. Of the 6 asked about their injuries, 3 were provided referral/assistance. The rest would have liked for someone to listen to them and provide shelter information.

Conclusions: Victims of domestic violence who present to the dental office with signs of injury want to be recognized and receive assistance/referral. Dental professionals should be trained to screen for abuse, ask questions about injuries to the head, neck, and mouth, recognize signs of domestic violence, and provide support.

Reviewer’s Comments: This is the first study to ask victims of domestic violence what they need from dental care providers. The subjects were victims already in shelters, so the results may not represent the views of victims still living in danger. More research is needed to fully understand the needs of this population and how dental professionals can help.

Additional Keywords: AGD Code: 156

print tag: () Refer to original journal article.
Metal Primers and Sandblasting Increase Bond Strength of Resin Cements to Zirconia Ceramic

Bond Strength of Resin Cements to a Zirconia Ceramic With Different Surface Treatments.
Cavalcanti AN, Foxton RM, et al:
Oper Dent; 34 (May-June): 280-287

Sandblasting and metal primers will synergize the bond to zirconia ceramic.

Background: The popular demand for aesthetic restorations had led to an interest for increased bond strength of resin cement to high strength ceramics. Traditional ceramic bonding techniques, which include porcelain etching and dentin bonding, are not recommended for high-strength ceramics (eg, zirconia) because the nonetchable ceramic substrate does not lend itself well to bonding.

Objective: To investigate the effect of different surface treatment methods and metal primers on the bond strength of resin phosphate-based cement and resin Bis-GMA-based cement to zirconia ceramic.

Methods: Extracted teeth were sectioned and further machined to create cylinders of dentin (1.3 mm X 0.8 mm). A total of 240 zirconia samples were equally divided and submitted to 1 of 3 surface treatments: (1) aluminium oxide sandblasting; (2) Er:YAG laser irradiation; or (3) ultrasonic alcohol cleaning as a control. The zirconia samples were further divided into the following metal primer subgroups: no primer, Alloy Primer (Kuraray), Metal Primer II (GC), and Metaltite (Tokuyama). Dentin cylinders were bonded to the zirconia samples with either resin phosphate-based cement (Panavia F2.0) or resin Bis-GMA-based cement (Calibra) and submitted to microshear bond strength testing after 24 hours.

Results: Bond strength data showed the metal primers increased the adhesion of zirconia to the resin cements regardless of the surface treatment. Aluminium oxide sandblasting performed better than Er:YAG laser surface treatment followed by the no surface treatment control. When zirconia specimens were sandblasted or surface treated with the laser, Calibra resin cement showed higher bond strengths than Panavia F2.0.

Conclusions: The use of metal primers along with aluminium oxide surface treatment increases the bond strength of resin cements to zirconia ceramic.

Reviewer's Comments: Because of the high strength of zirconia ceramics, the requirements for high bond strengths with full coverage restorations is limited, such as for an over reduced preparation needing greater retention. However, the current results show promise for the possible expanded application of zirconia ceramics to partial coverage restorations, such as inlays and onlays, in the future.

Additional Keywords: AGD Code: 017

print tag: () Refer to original journal article.
All-in-One Adhesives Under Perform When It Comes to Bonding to Enamel

Bonding Potential of All-in-One Adhesives to Ground Enamel.
Margvelashvili M, Beloica M, et al:
Int Dent SA; 11 (January/February): 64-69

Fifth-generation adhesives outperform all-in-one seventh-generation adhesives when bonding to enamel.

Background: The evidence to support use of self-etch adhesives on enamel is equivocal and frequently dependent on adhesive brand.

Objective: To determine the microtensile bond strength of 3 different seventh-generation self-etch (all-in-one) adhesives to cut enamel.

Methods: Extracted human teeth were flattened to expose dentin and were randomly divided into 4 dental adhesive groups: (1) Bond Force (Tokuyama), (2) AdheSE One (Ivoclar), (3) Xeno V (Dentsply), and (4) fifth-generation control, Prime&Bond NT (Dentsply). Adhesives were applied according to manufacturers' instructions followed by bonding with composite resin. Bonded teeth were then sectioned vertically to create 10 to 15 beams per tooth and submitted for the microtensile bond test.

Results: The fifth-generation adhesive control (Prime&Bond NT) showed the highest bond strength to enamel among all adhesives. Only 1 self-etch adhesive (Bond Force) approached the bond strength of the control. AdheSE One and Xeno V demonstrated significantly lower adhesion compared to the etch-and-rinse fifth-generation adhesive.

Conclusions: The seventh-generation self-etch adhesives investigated in this study resulted in lower bond strengths to enamel than did the fifth-generation etch-and-rinse adhesive.

Reviewer's Comments: The results of this study add to the notion that simplified adhesives result in reduced bonding effectiveness. Based on longevity studies, the fourth-generation, 3-bottle etch-and-rinse systems are still the gold standard (J De Munck, 2005). This study also demonstrates the variability of bonding effectiveness among self-etch adhesive brands. Bond strength values among self-etch adhesives ranged from a high of 29.99 MPa (Bond Force) to a low of 18.76 MPa (Xeno V), which was much lower than the 43.48 MPa strength of the standard etch-and-rinse adhesive (Prime&Bond NT).

Additional Keywords: AGD Code: 017

print tag: () Refer to original journal article.
In Patients With Chronic Oral Infections, Be Alert to Potential Cardiovascular Disease

**Association Between Chronic Dental Infection and Acute Myocardial Infarction.**

Willershausen B, Kasaj A, et al:  
*J Endod;* 35 (May): 626-630

Presence of untreated endodontic lesions can indicate presence of coronary artery disease and risk for acute myocardial infarction.

**Background:** In recent years, several studies have established a relationship between chronic oral infections and systemic diseases, including coronary artery disease and risk of acute myocardial infarction (AMI).

**Objective:** To compare oral conditions in patients with a history of AMI undergoing a dental examination (including radiographs) and medical history, with those from a similar cohort of patients without a prior history of AMI.

**Participants:** 125 middle-aged to geriatric subjects with a history of recent AMI (within 1 to 5 months of the study), and a control group of 125 age-matched patients with no evidence of cardiovascular or other serious disease 6 to 12 months prior to their dental exam.

**Methods:** Patients underwent a complete dental exam with radiographs. Data included number of teeth present, number of endodontically treated teeth, and decayed, missing, or filled teeth. Periapical lesions were assessed and classified as either periodontal or endodontic origin. Periodontal exams noted probing depths, bleeding on probing, attachment level, and periodontal screening scores (graded 0 to 4). Medical history included age, sex, weight, history (including smoking), and a variety of lab blood test values, including C-reactive protein. Outcomes were statistically compared using parametric and non-parametric tests.

**Results:** There were no significant differences between groups for age or sex. Subjects in the AMI group had significantly higher incidences of being overweight or obese, diabetes, and smoking. The AMI group had significantly higher numbers of missing teeth, dental infections, and periodontal disease indicators. However, there was no significant difference in periapical lesions of endodontic or periodontal origin, although the AMI group had more lesions of endodontic origin that were untreated, and healthy controls had a greater proportion of periapical lesions that had been endodontically treated (26.4% untreated, 74.6% treated). No statistically significant correlation was found between periapical lesions and serum low-density lipoprotein, blood glucose, HbA1c levels, leukocytes, or fibrinogen levels.

**Conclusions:** Patients with recent AMI have a greater incidence of untreated, chronic dental disease than their healthy counterparts, including more untreated endodontic lesions and a greater evidence of periodontal disease.

**Reviewer's Comments:** The findings of this study confirm the general relationship between cardiovascular disease, adverse cardiac events, physical health, socioeconomic issues, and dental health. Patients with recent AMI are likely to have endodontic and periodontal treatment needs, although the effect of dental treatment in this group on the prognosis for future cardiovascular events remains to be established. The interaction of many systemic and oral disease variables remains to be identified.

**Additional Keywords:** AGD Code: 490

**print tag:** () Refer to original journal article.
Orthodontic Patients Gain Esthetic Advantages From Fluoride Varnish

Fluoride Varnish Applications May Reduce the Formation of White Spot Lesions (WSL) Adjacent to Orthodontic Fixed Appliances.

Martinez-Mier EA;
J Evid Based Dent Pract; 9 (March): 16-17

Fluoride varnish should be added to preventive regimens during orthodontics.

Background: White-spot lesions (WSLs) are frequently associated with orthodontic therapy and adversely affect dental esthetics following removal of orthodontic appliances.

Objective: To describe a meta-analysis and evaluation of a study in Sweden that included children with maxillary orthodontics, designed to evaluate the effect of application of a fluoride varnish immediately after bonding of appliances and every 6 weeks over a 6-month period.

Design: The author applied a level-of-evidence/strengths-weaknesses analysis to data that were originally reported in 2007 in a peer-reviewed dental journal.

Participants: 302 children aged 12 to 15 years were initially studied, and a total of 257 actually completed the study.

Methods: The author applied statistical and clinical-scientific review of the study, which compared effects of applying a fluoride varnish versus placebo immediately after bonding orthodontic appliances and every 6 weeks for a total of 6 months, using photographs to assess the frequency of development and severity of WSLs.

Results: The author highlighted 2 major weaknesses in the analyzed report, including the lack of a recommendation for the frequency of application of fluoride varnish to prevent WSLs in orthodontic patients, and use of non-standardized photographs as the sole means to assess study outcomes. A major strength of the study was use of a double-blind protocol and a placebo varnish.

Conclusions: This analyzed study adds to the already-established evidence for the benefit of regular fluoride applications in orthodontic patients, and the evidence from this study is classified as level 2 (limited-quality, patient-oriented). These data should be evaluated in the context of guidelines for the frequency of fluoride varnish applications in patients at high risk for caries, which currently call for applications every 3 to 6 months, so that the optimal frequency of application in these patients remains to be established.

Reviewer’s Comments: Fluoride varnish would be expected to reduce the formation of WSLs in orthodontic patients. However, the required frequency and absolute benefit of varnish relative to other forms of fluoride application (eg, sodium fluoride mouth rinses, high-fluoride toothpastes) remain to be established.

Additional Keywords: AGD Code: 432

print tag: () Refer to original journal article.
Subanesthetic Ketamine Dose Plus Local Anesthesia Improves Recovery

Assessment of Combined Local Anesthesia and Ketamine for Pain, Swelling, and Trismus After Surgical Extraction of Third Molars.

Satilmis T, Garip H, et al:
J Oral Maxillofac Surg; 67 (June): 1206-1210

As experience with mixtures of local anesthetics with other drugs is accumulated, intraoperative and postoperative pain control can improve.

**Background:** While ketamine is traditionally used to induce a state of "dissociative anesthesia," it possesses potential usefulness as an analgesic at subanesthetic doses, at least in part because of interactions with opioid receptors and spinal NMDA receptors involved in pain impulse transmission.

**Objective:** To evaluate co-administration of a mixture of local anesthetic and low-dose ketamine on intraoperative and postoperative complications of third-molar surgery.

**Participants:** 50 healthy (ASA I) adults or adults with mild systemic disease (ASA II) aged 17 to 39 years (average, 24.5 years).

**Methods:** Subjects who were undergoing surgical removal of mandibular third molars were randomly stratified into 2 parallel-treatment groups, 1 to receive local anesthesia with articaine 4% alone, and 1 to receive articaine 4% with 0.3 mg/kg ketamine (approximately one tenth the anesthetic dose). Prior to third-molar surgery, subjects received 2 mL of local anesthetic diluted with 3 mL of saline (LAA group; 25 patients) or 2 mL of local anesthetic plus 3 mL of a ketamine-saline combination (LAK group; 25 patients). The parameters compared statistically included duration of surgery, time in operating room, patient satisfaction, operator satisfaction, facial swelling and trismus (determined by direct facial measurements), and pain (visual analog scale [VAS] scores, 1 to 10) at various intervals following surgery (30 minutes and 1, 4, 12, and 24 hours) and analgesic use.

**Results:** There were no differences in age, sex, height, or weight of subjects between groups. In the LAK group, facial swelling and trismus were generally significantly lower than in the LAA group, as were VAS scores at all time points. Additionally, a greater number of subjects in the LAK group than in the LAA group rated their experience as "excellent" (22 vs 8).

**Conclusions:** The combination of local anesthesia and subanesthetic doses of ketamine produces both local anesthesia and better control of postoperative pain and other sequelae than does local anesthesia alone.

**Reviewer's Comments:** On a pharmacologic basis, this study confirms some of the known properties of ketamine and the results of similar medical studies. A weakness of the study, however, was the apparent lack of blinding of the evaluator. Caution is advised when applying this work to other dental pain models, however, as ketamine is known to produce its hallucinogenic effects even at subanesthetic doses. Even so, combinations like this need more prominence in dental research.

**Additional Keywords:** AGD Code: 132

**print tag:** () Refer to original journal article.
More Proof That Opposing Restorations, Occlusal Guards Are Important to Protect PFM Restorations

Retrospective Analysis of Porcelain Failures of Metal Ceramic Crowns and Fixed Partial Dentures Supported by 729 Implants in 152 Patients: Patient-Specific and Implant-Specific Predictors of Ceramic Failure.

Kinsel RP, Lin D: J Prosthet Dent; 101 (June): 388-394

To reduce the risk of porcelain failure on porcelain-fused-to-metal crowns and bridges, screen carefully for occlusal factors, including bruxism and opposing restorations.

**Background:** Fractured porcelain is a key factor in the failure of porcelain-fused-to-metal (PFM) crowns and has important implications for implant-supported restorations of this type.

**Objective:** To attempt to identify risk factors for porcelain fracture in implant-supported PFM crowns and fixed-partial dentures (FPDs).

**Participants:** Patients from a single private practice with implant-supported PFM restorations using a single high-noble alloy, a single type of feldspathic porcelain, and a single implant system (Straumann) were retrospectively evaluated over a 6-month period.

**Methods:** 998 PFM restoration units (390 single crowns and 94 FPDs) supported by 729 implants in 152 patients were evaluated. Restorations were evaluated using 2 categories for porcelain failure: minor failures, which had deficient surfaces but could simply be polished, and major failures, which required repair or replacement of the restoration. Patient data included age, sex, occlusion (anterior guidance vs group function), presence of bruxism, and use of an occlusal guard. Statistical analysis was designed to detect patient-specific and implant-specific variables as significant predictors of porcelain failure.

**Results:** Of 998 PFM restoration units, 94 porcelain failures occurred in 35 of 152 patients. Porcelain failure was statistically significantly associated with opposing implant-supported PFM restorations, bruxism, and non-use of acrylic occlusal guards. Of major failures, 79% were associated with the restoration being the occlusal opponent of another implant-supported PFM restoration, while only 5% were opposing natural teeth.

**Conclusions:** The porcelain of implant-supported PFM restorations is 5 times more prone to failure than are PFM restorations supported by natural teeth, and major risk factors were occlusion in opposition to other implant-supported PFM restorations, a bruxism habit, or failure to use an occlusal guard. This failure rate may be associated with lack of a neurosensory mechanism in implants that compensates for the proprioceptive sensation and compression of natural teeth.

**Reviewer's Comments:** While limited by the potential of laboratory-associated variations in restoration fabrication and lack of comparison to more implant systems, this study is consistent with current recommendations of many experts regarding careful evaluation of occlusal factors, particularly bruxism, when planning implant-supported PFM restorations.

**Additional Keywords:** AGD Code: 695

**print tag:** () Refer to original journal article.
Gloves Are Important for Infection Control, but Poorly Understood

Effectiveness of Gloves and Infection Control in Dentistry: Student and Provider Perspectives.
Kanjirath PP, Coplen AE, et al:
J Dent Educ; 73 (May): 571-580

Gloves do NOT provide 100% protection and do NOT replace handwashing; they should be changed more frequently during long and/or stressful procedures.

Background: Gloves are standard for infection control in dental practice, but variations in manufacturers and materials require that dental providers be educated about the gloves they use.

Objective: To determine the knowledge of dentists, dental postgraduate students, and dental and dental hygiene students about the types of gloves they prefer to use for infection control and the rationale for their preferences.

Design: This study is based on a survey of 3 groups: dentists, dental hygienists, and dental/dental hygiene students at a U.S. dental school. The survey focused on preferences for infection control procedures, including preferences for various types of dental gloves, and their understanding of the effectiveness and other properties of gloves.

Participants: Second-, third- and fourth-year dental students, third- and fourth-year dental hygiene students, graduate students, and practicing dentists and dental hygienists were included as survey respondents.

Methods: Surveys were administered at a regularly scheduled class for the students or at a continuing education course for the practitioners; 198 dental and dental hygiene students, 35 graduate students, 28 practicing dentists, and 51 practicing dental hygienists responded to the survey.

Results: 96% of practicing dentists and 92% of practicing dental hygienists indicated that they had a clear preference for a certain type of glove, while 76% to 79% of students had a preference. Comfort was most frequently cited among all groups as their basis for preferring certain types of gloves, while cost was the least important determinant. Concern for allergies was intermediate, with approximately 25% of the respondents indicating this as a factor in selection of gloves. Less than 40% of the respondents correctly recognized differences in the protective properties of various types of gloves and the effect of length of dental procedures and types of organisms (bacteria, viruses) on the level of protection afforded by gloves.

Conclusions: This study indicates a basic lack of knowledge among students regarding certain infection control procedures, including the relative importance of hand washing versus the use of gloves and the importance of changing gloves more frequently to reduce contamination.

Reviewer's Comments: Despite the fact that this study was limited to a single university and geographic area of the U.S., it points out the need to consider factors other than comfort as critical in the effective use of latex and other types of gloves to reduce exposure of health care providers to infectious hazards in dental practice. Dental personnel need to improve their knowledge of the importance of hand washing and changing gloves in infection control practices.

Additional Keywords: AGD Code: 148

print tag: () Refer to original journal article.
Post Strength Enhanced by Larger Diameters and Titanium Posts

Yield Strength of Fiber-Reinforced Composite Posts With Coronal Retention.

Schmage P, Nergiz I, et al:
J Prosthet Dent; 101 (June): 382-387

Based on yield strength testing outcomes, titanium posts or cast posts and cores remain preferable for teeth with extensive loss of coronal tooth structure.

**Background:** In endodontically treated teeth, glass fiber-reinforced composite (FRC) posts are currently limited to use in teeth with moderate coronal defects, and teeth with extensive coronal defects must be restored with posts with high bending resistance.

**Objective:** This study was designed to evaluate and compare the yield strengths of 2 types of restorative posts, fiber-reinforced composite and titanium, with and without, retentive head (RH) features or parallel shanks (SH) and having 2 lengths (9 mm and 12 mm).

**Design:** Posts in each category were tested by application of a perpendicular bending force to each post at a fixed distance from the point of fixation to the device.

**Methods:** There were 9 specimen posts in each group. A universal testing machine applied a cutting edge to each post using a perpendicular force 2.5 mm from the post tip (6.5 mm from fixation for the 9-mm posts and 9.5 mm from fixation for the 12-mm posts). Statistical tests of yield strength values included a 4 (post diameters) by 2 (post materials) by 2 (coronal features) 3-way Analysis of Variance (ANOVA) to evaluate interactive effects of the variables.

**Results:** Post diameter, material, and coronal features (retentive versus parallel) significantly affected post yield strengths, as did the interactions between the various features (eg, diameter X post material).

**Conclusions:** The presence of a retentive head on fiber-reinforced composite posts does not improve strength over the parallel shank design. Titanium posts with retentive heads are significantly stronger than fiber-reinforced composite posts of similar design for both 9- and 12-mm post lengths, and, generally, larger post diameter is consistently associated with higher yield strengths for both types of post material.

**Reviewer's Comments:** Yield strengths of a post are important physical properties to guide the restoration of endodontically treated teeth. However, in vitro tests alone cannot be totally relied upon to determine the best post for a given clinical indication. Post length, resistance to rotation, the presence of a ferrule, aesthetic considerations, and the possibility of root fracture with more rigid posts are among the clinical variables that remain challenging design considerations in the restoration of endodontically treated teeth.

**Additional Keywords:** AGD Code: 017

**print tag:** () Refer to original journal article.