ometer. The results were statistically analyzed by using the MINITAB statistical software. **Results:** Statistical analysis showed reduction of microleakage in teeth were laser irradiation was applied prior to root canal filling as compared to control groups, in which only root canal filing was performed ($p < 0.005$). The results also demonstrated that there were no significant differences between the two laser groups ($p > 0.005$). **Conclusion:** Laser-assisted root canal treatment leads to a reduction of microleakage.

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Non-Surgical Use of Laser in Chronic Apical Periodontitis

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Purpose: The purpose of this study was to evaluate and compare the clinical results in teeth with chronic apical periodontitis with laser-assisted root canal treatment (980 nm diode laser and 1064 nm Nd:YAG Laser). **Material and Methods:** A total of 86 patients underwent root canal treatment using sodium hypochlorite as irrigation solution and laser, with a temporary filling with calcium hydroxide paste for 30 days. In group A, the 980 nm diode laser was used (1.5–3 W; pulse width 0.01–0.02 sec; resting time 0.01–0.02 sec; 3 exposures/procedure); in group B the Nd:YAG laser (1.5W, 15 Hz, 10 sec, 3 exposures/procedure). In group C, root canals were instrumented using sodium hypochlorite and calcium hydroxide paste. Initial and follow-up radiographs were assessed using the periapical index (PAI) and CT-scan. The healing results were evaluated at 45 days, 60 days and 90 days. The pain after inflammation and the radiological data were introduced in a standardized study, coded and analyzed statistically. **Results:** Laser-assisted root canal treatment provides favorable outcomes in 94% of cases. A statistically significant difference ($P < 0.005$) was found between the group A and C and B and C. There was no significant difference in the rate of radiographic healing of teeth with chronic apical periodontitis in groups A and B. **Conclusion:** The positive evolution in the laser treatment of chronic apical periodontitis is not significantly affected by laser wavelengths used in this study (980 nm or 1064 nm).

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Diode Laser Microhardness Enamel Effect after Dental Bleaching Associated or not Associated Fluoride

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The aim of this in vitro study was to evaluate the human dental enamel microhardness after the application of the bleaching agent containing hydrogen peroxide at 35% (HP)activated by laser 830 nm (L) (Opus Dent 10) associate or not with the topical application of a 1,23% phosphate acidulated fluoride (PAF). Sixty enamel fragments obtained from impacted human third molars were used. They were embedded, flattened and randomly designated in three groups (n = 20). The group 1 (PAF + L) received the fluoride application associated whit the laser. The group 2 (HP + L), received three applications of the bleaching agent for five minutes and photoativated with the laser for 30s in each application. The group 3 (HP + L + PAF + L), beside the procedure described in group 2, also received after bleaching a 1, 23% phosphate acidulated fluoride for one minute photoativated for 30 seconds. The microhardness analyses were performed before and after the application of the treatment agents. The analysis of variance (ANOVA) followed by the Tukey test and t-student test ($p < 0, 05$) showed significant higher microhardness values for PAF + L after treatment. No significant differences were showed before and after treatment for HP + L and HP + L + PAF + L. Although not presenting enamel microhardness changes after the HP activated by L associated or not with the application of PAF, it seems there is an increase in mean microhardness when PAF was activated with L.

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Doppler Velocimetry of Blood in Temporomandibular Dysfunction Pain after Diode Laser Treatment

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The Orofacial pain occurs in high number of patients, associated to the pathologies of the Temporomandibular joints (TMJ). Intending to treat pain provoked by the temporomandibular dysfunction (DTM) the purpose of this work was to measure the velocimetry of blood flow in temporal artery. After signing Informed Consent, 20 female patients between 20 and 50 were randomly divided into two groups. These groups make a complaint Orofacial pain, provoked by DTM, telling tensional headache and migrânea. Control groups (n = 10), not presented of this pathology with VFPS (Velocity Flux Systolic Pulse) averages of with they enter in 60–70 cm/s. Evaluation of blood flow was submitted of each group (n = 10), immediately before and immediately after laser therapy in each sides of TMJ, a single treatment was performed using a defocused high power laser emitting with wave-

length 830 nm, dose of 124.78 J/cm² during 30 s. For group II (GII), a low power 830 nm-lasers was used with a dose of 120 J/cm² for 34 s. Flow blood dosed in each side with Doppler, measuring the Flux Velocity in Diastole Pulse (VFFD); Medium Speed of Flow (VMF); Index of Resistance Pourcelot (IR). Flow blood decrease was significant after laser therapy, in both of groups. This nom-invasive method can be showed that laser therapy promote vasodilatation in temporal artery as a result of that increase irrigation and oxygenation after irradiation relief the symptom, composing treatments already existent to TMD pain.

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Histomorphometric Evaluation of Formocresal and Er;Cr:YGSS in Canine Primary Teeth Pulpotomy

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Background: Today dental practitioners routinely use form cresol for pulp treatment of primary teeth. Due to its potential hazards including toxicity, mutagencity and even carcinogenicity, induced in some earlier reports, it's use has been always associated with some concerns in children. The investigation aimed on the applicability of an alternative method: Er;Cr:YSGG and its histomorphometric evaluation to form cresol pulpotomy in canine primary teeth. **Methods and Materials:** The study was concluded on 60 primary teeth of 12 forty five days old dogs. Each contra lateral canine of dogs had received one of two methods of pulpotomy. Before and after of treating, clinical and radiographic evaluation was done. 6 dogs sacrificed in 7 days post treatment and 3 dogs in 60 th day. Then, specimens evaluated histomorphologically. **Results:** There were no significant clinical and radio graphical differences in two methods in two intervals. In 7th day, there were significant differences between surface odontoblastic layer, hemorrhage, superficial inflammation, necrosis, internal resorption, vascularization, hyperemia and quantity of abscess layer between two methods of therapy. In 60th day, there were significant differences only between deep inflammation, necrosis and quantity of hemorrhage layer. **Conclusion:** Based on the results of this investigation, it seems that Er;Cr:YSGG is a safer treatment and with less complications in pulpotomy of primary teeth.

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Laser Applications in Endodontic Practice

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Various wavelengths can be useful in endodontic practice. The use of Er:YAG laser (λ = 2940 nm), Nd:YAG laser (λ = 1064 nm) and helium-neon laser (λ = 632.8nm) was illustrated by clinical cases of endodontic retreatment (orthograde and retrograde ways): (1) In case of orthograde treatment: an Er:YAG laser (Fotona Fidelis Plus II™) have been used for the gingivectomy (gingival hyperplasia) by laser irradiation at 150 mJ and 15 Hz (sapphire tip 0.8 mm in diameter in contact mode, fluence: 30 J/cm²). Pre-endodontic reconstitution was realized to put the operating field. The root canal disinfection was conducted by Nd:YAG laser irradiation (Fotona Fidelis Plus II™) in 2.5% sodium hypochlorite. The parameters of laser irradiation were 1,5 W and 10 Hz (≅ 200 pulses per tooth). (2) In case of retrograde treatment: the parameters of Er:YAG laser irradiation were 350 mJ and 15 Hz for incision (sapphire tip 0.8 mm in diameter in contact mode, fluence: 30 J/cm²), 350 mJ and 15 Hz for bone trepanation (fluence: 30J/cm²) and 200 mJ and 15 Hz to prepare retrograde cavities in apical and lateral positions (perforations) (fluence: 40 J/cm²). The desinfection of surgical cavities was realized with Nd:YAG laser, with the use of a 200 µm endodontic fiber at 2 W and 10 Hz. (3) The cicatrisation was improved by He-Ne laser irradiation (3 times of 5 minutes). The combination of Er:YAG and Nd:YAG lasers allowed the following advantages: slight bleeding, better operative conditions with more easier and faster retrograde filling (compared with usual technique), good visibility, discreet postoperative reactions and fast cicatrisation. This new technology represents a significant help in endodontic practice.

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Splinting of Periodontally Involved Teeth: Enamel Treatment Using Er:YAG Laser

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Tooth mobility has been described as an important clinical parameter in predicting periodontal therapy prognosis. For this reason and for patient comfort, splinting has been the recommended therapy to stabilize teeth. The clinicians want to approach the decision to splint teeth with the most conservative technique possible. The possible use of Er:YAG laser (λ = 2940 nm) in complement of usual procedure was illustrated by two clinical cases of periodontal splinting. Those two cases were treated for periodontally involved mandibular teeth. Lingual enamel surfaces of mandibular incisors, canines and premolars was Er:YAG laser irradiated (Fotona Fidelis Plus II™) using a sapphire tip 0.8 mm in diameter in contact mode, under air/water spray, at 180 mJ and 10 Hz (fluence = 36 J/cm²). The teeth to be splinted were etched for 30 seconds with a phosphoric acid gel etchant on both the