

OR  
23**Influence of different sterilisation procedures on the bending moment of stainless steel and nickel-titanium root canal instruments.***B. Briseño Marroquín and B. Willershausen*  
Department of Operative Dentistry, Johannes Gutenberg University, Mainz, Germany

The purpose of this study was to determine the influence after different sterilization cycles on the bending moment of root canal instruments. A total 4320 root canal instruments were distributed according to their characteristics. The instruments investigated were nickel-titanium and stainless steel (Micro Mega, Maillefer and Zipperer) K-type files, reamers, and Headstrom files sizes 15, 20 and 30 (n=15 each group). The diameter preciseness was established through measurements made at 4 and 12 mm from the instrument tip. Afterwards the instruments were sterilized with an autoclave (120°C/60min) and a glass bead sterilizer (240°C/15s) 1, 5 and 7 times. A non-sterilized group of each instrument type and size served as control. The results were statistically analysed with the Analysis of Variance, Least Significance Difference and Jonckheere's S<sub>j</sub>-trend test. The diameter results showed that the instruments from Micro Mega had the highest standard deviations. The bending moment trials showed with the nickel titanium and stainless steel instruments no statistical significant differences between a group of instruments of the same type and size and the different sterilization cycles. However, statistically significant differences were always found between the nickel-titanium and stainless steel instruments of the same type and size. Our results suggest that, in accordance to ISO-norms ( $\pm 0.02$  mm), efforts should be undertaken to arouse the diameter consistency of the instruments. That since the bending moment of the instruments does not increase after sterilization a rigidity increment can not be expected. That discrepancies found in the diameter measurements are more liable to have an influence on the bending moment than the sterilization of root canal instruments.

OR  
24**Histological evaluation of repair after mechanical perforation in dogs' teeth using a bioresorbable membrane beneath a resin modified glass ionomer.***M.A. Salman\*, N. Claffey*  
Trinity College, Dublin

Atrisorb® is a guided tissue regeneration (GTR) barrier which has been shown both clinically and histologically to produce favourable periodontal regenerative outcomes. The purpose of the present study was to evaluate the histological response to Atrisorb® when used as a matrix under a light cured glass ionomer sealant in the repair of furcation perforations in experimental animals. Following anesthesia, pulp extirpation and filling of radicular pulp with ZOE cement, furcal perforations were made in 20 lower premolar (P<sub>2</sub>, P<sub>3</sub> and P<sub>4</sub>) teeth of Labrador dogs with a 1 mm diameter round bur in a conventional handpiece. The perforated teeth were randomly divided into 2 groups of 10 teeth. Group 1 teeth were tested with light cured glass ionomer alone and Group 2 with Atrisorb® barrier under the light cured glass ionomer. Four teeth without a perforation served as negative controls. Pulp chambers of all teeth were filled with light cured glass ionomer. Animals were sacrificed after 3 months. The teeth and the surrounding structures were processed for light microscopy. There were no differences found between results for glass ionomer alone and Atrisorb® barrier with glass ionomer. The conclusion of this study is that the placement of an Atrisorb® barrier at the pulp chamber aspect of a furcation perforation did not result in superior healing compared to the use of glass ionomer alone.

OR  
25**Characterization of neural changes in the diabetic rat.***D.C. Gruber\*, D.E. Witherspoon, J.L. Gutmann*  
Baylor College of Dentistry, Texas A&M University System

The inflammatory response to injury in the pulp involves the neuropeptides Nerve Growth Factor (NGF) and Calcitonin Gene Related Peptide (CGRP). A deficiency in these factors may result in compromised tissue viability. Metabolic abnormalities attributable to diabetes mellitus (DM) provoke changes in neuropeptide production, transport or expression (Tomlinson et al. 1997). The presence of Gamma Linolenic Acid (GLA) in the dietary supplement Evening Primrose Oil (EPO) helps restore altered lipid metabolism in DM, but the response of neural elements has not been investigated. The purposes of this study were to examine the effect of DM & EPO on expression of CGRP in tooth pulps and NGF in trigeminal ganglia. Genetically bred non-diabetic and diabetic rats were randomly placed in groups of 1) Non-DM (n=20), 2) DM (n=20), 3) DM/EPO (n=20). Within each group, half had a mechanical pulp exposure of a single mandibular incisor. Animals were sacrificed 96 hrs post injury and radioimmunoassay was used for CGRP determination of the ipsilateral pulp tissue, while ELISA was used for NGF determination of the ipsilateral trigeminal ganglion. ANOVA was used to compare statistically all experimental groups. CGRP content was not significantly different among the groups. There was a significant difference in NGF levels between Non-DM and DM (p<0.006) and between Non-DM and DM/EPO groups (p<0.012). In this experiment, ingested EPO had no affect on the neuropeptides assayed. The research was supported in part by an Endodontic Resident Grant from the AAE Foundation.

OR  
26**The effectiveness of chlorhexidine in the prevention of root canal reinfection.***S. Jung\*, K. Safavi, L. Spångberg*  
University of Connecticut, Farmington, CT

In the period between the root canal filling and final tooth restoration the dentin/root filling interface is susceptible to reinfection. Chlorhexidine digluconate (CHX) renders long-term antibacterial properties to dentin due to CHX's unique ability to bind to hydroxyapatite. The aim of this study was to evaluate the efficacy of CHX pre-treatment in reducing coronal bacterial leakage. The canals of bovine root segments were instrumented, autoclaved, and immersed in CHX, NaOCl, or sterile saline for 5 min. The canals were obturated. The coronal portion of each segment was adapted to and sealed to a tube, forming the upper chamber of the experimental apparatus. Each assembled segment was suspended in a test tube containing bacterial culture medium forming the lower chamber of the apparatus, with the apical 2 mm of the root segment immersed in the medium. Bacterial culture medium or sterile medium (negative controls) was added to the upper chamber. The test tubes were incubated at 37°C, replenished with fresh medium every 2 d for 35 d, and examined periodically for turbidity in lower chambers. No turbidity was observed in the negative controls. Turbidity was observed in 80% of saline and in 70% of NaOCl treated samples in less than 24 hours. CHX pretreatment prevented turbidity in 80% of the samples up to end of the experimental period. ANOVA analysis showed a statistically significant difference between the CHX and the other 2 groups (p<0.001). There was no statistically significant difference between NaOCl and saline groups. It was concluded that pretreatment of the root segments with CHX effectively prevented root canal infection.