945 A Longitudinal Study of Subgingival Microflora in Periodontitis Patients with Different Treatment Response. P.-Ö. SÖDER*, L. J. JIN, U. NEDLICH and B. SÖDER. (Karolinska Institute, Stockholm, Sweden).

The aim of the 5-yr study was to determine the presence of *A. actinomycetemcomitans* (*A.a.*), *P gingivalis* (*P.g.*), *P. intermedia* (*P.i.*) and *Spirochetes* in periodontitis patients with different treatment response. 14 patients with severe periodontitis participated. After an initial intensive treatment, they were maintained in a 6-month recall program for 5 yrs. They were then classified into treated healthy group (TH-group, n=7), and uncontrolled disease group (D-group, n=7). At baseline and at 3 months, 6 months. 1 yr, 3 yrs and 5 yrs, subgingival plaque samples were taken with two sterile paper points from one site with deepest probing depth and from the six Ramfjord teeth in both groups. The samples were immediately transferred to laboratory for cultivation or dark-field microscopic analysis. ANOVA was used for the statistical analysis. At baseline, spirochetes were detected in 5 subjects from the TH-group and 7 subjects from the D-group. The % of spirochetes was significantly higher in the D-group (24.0 %) than that in the TH-group (6.2 %) ($p<0.001$). The detection rate for *P g.* was higher in the D-group (4 / 7) than that in the TH-group (1 /7). During the 5 yrs, the difference in the amount of colony forming unit (CFU) maintained between the two groups (TH-group / D-group), 3.6×10^7 / 8.5×10^7 at baseline, and 2.0×10^7 / 4.7×10^7 at 5 yrs. The *P.i.* % of CFU was significantly ($p< 0.01$) higher in the D-group than that in the TH-group, consistently at 3 months, 6 months, 1 yr and 3 yrs. *A.a.* was consistently detected in one subject from the D-group during the 5 yrs. This study suggests that long-term treatment response in periodontitis patients seems to be related to the differences in initial colonization and consistent harbor of certain subgingival microflora, both qualitatively and quantitatively. The study was supported by the Karolinska Institute and the Swedish Institute.

946 The Effects of Bacterial Survival on Treatment Outcomes Following Periodontal Therapy. J. SHILOAH*, M.R. PATTERS, J.W. DEAN, P. BLAND, and G. TOLEDO (Dept. of Periodontology, Univ. of Tennessee, College of Dentistry).

Previously reported data from this longitudinal study indicate that pathogenic bacterial species often survive periodontal therapy. The present report analyzed the effects of bacterial survival on treatment outcomes of four randomized treatment modalities in twelve patients with adult periodontitis. All patients had at least one tooth in each quadrant that had an inflamed pocket of probing depth ≥5 mm with probing attachment loss, and harbored at least one of the following three major periodontal pathogens: *Actinobacillus actinomycetemcomitans* (Aa), *Porphyromonas gingivalis* (Pg),and *Bacteroides forsythus* (Bf). The number of target organisms per site was determined pre-operatively, at 1 week and 1 and 3 months post-operatively utilizing DNA probes. The following clinical parameters were measured and recorded pre-operatively and at 1 and 3 months post-treatment: gingival fluid flow, gingival index, plaque index (PI), probing depth, probing attachment level, gingival recession, and bleeding on probing (BOP). One quadrant in each patient was randomly assigned to each one of the following four treatment groups: 1) scaling and root planing, 2) pocket reduction through osseous surgery and apically-positioned flap, 3) modified Widman flap, and 4) modified Widman flap and topical application of saturated citric acid at pH 1 for 3 min. All four treatment modalities were rendered in one appointment using local anesthesia. No post-operative antibiotics were used, but the subject rinsed with 0.12% chlorhexidine. This investigation showed: 1) 31.3% of the sites remained infected by at least one species at 3 months postoperatively. These infected sites lost 1.1±0.4mm compared to a change of 0.0±0.3mm for uninfected sites. 2) The infected sites had a significantly greater PI and BOP (0.9±0.3, 73±12% compared to 0.3±0.1 and 30±8% for the uninfected sites, respectively). 3) No statistically significant differences were observed among the other clinical parameters assessed. These results suggest that survival of microbial pathogens negatively affects the short-term outcome of periodontal surgical and non-surgical therapy. This study was supported by The University of Tennessee, College of Dentistry, Alumni Endowment Fund.

947 Inhanced Neutrophil Phagocytosis of *Treponema denticola* after Therapy in RPP Patients. P. PURUCKER*, I. KLEMMT, B. KRÜGER, J.-P. BERNIMOULIN, (Humboldt-University, Charité, Periodontology, Berlin, Germany)

The neutrophil granulocytes (PMNs) are the key components in the protection of the periodontium against pathogenic bacteria. Previous studies have indicated that in patients with early onset periodontitis, the function of neutrophils may be impaired. The aim of the present single blind study was to compare the neutrophil phagocytosis of patients with clinical and radiographical diagnosis of rapidly progressive periodontitis (RPP) with control subjects without periodontitis at baseline (BL) and 3 months after therapy. 19 patients, average age 33 2 years, were selected according to the clinical and radiographical criteria described by Page et al. (1983). 19 age, sex and smoking/non-smoking matched persons served as controls. No subject had any evidence of systemic disease. After an initial treatment, with oral hygiene and supragingival depuration, all patients received a thorough scaling/root planing in each quadrant followed by the administration of antibiotics (Augmentin®). At baseline and 6 months later the PMNs were isolated from peripheral blood and prepared simultaneously with the controls. In order to test the phagocytosis 0.1 ml of PMN cell suspension were incubated with 0 1 ml of *Treponema denticola* cell suspension, which was opsonized with either patient or control serum. The analysis of granulocytes with phagocytosis was performed with a flow-cytometric method (Kimura et al. 1992). The results showed, that after therapy the relative phagocytosis of patient granulocytes, if compared with the control granulocytes, is statistically significant ($p<0.035$) improved. On the other site the ingestion of *T. denticola* in the granulocytes didn't change after therapy. These results demonstrate, that in RPP patients, after successful therapy, the proportion of neutrophils with phagocytosis increased. This could be of importance in the evaluation of treatment success in patients with early onset forms of periodontitis. This study was partially supported by the DFG, We 1414.

948 The Effectiveness of Root Planing Following Short Term Pocket Distention. E. SHEN, P.J. ROBINSON*, M. GEIVELIS, AND D. MADDALOZZO (Northwestern University, Chicago, Illinois, USA)

The principal objective of this study was to evaluate the effectiveness of root planing following short term pocket distention. Seventy-five periodontally involved single rooted teeth with a range in probing depths of > 5mm < 10mm were selected. All teeth selected were treatment planned for extraction. The teeth were randomly divided into 3 treatment groups. In Groups 1 and 2 gingival retraction cord was packed subgingivally for 30 minutes. Following removal of the cord the teeth were scaled and root planed (Group 1 had aluminum sulfate impregated cord and Group 2 had non-impregated cord). In Group 3 the teeth were root planed only and served as the controls. In all groups, root planing was performed until the root surface was tactilely smooth. Following instrumentation, the teeth were extracted and were examined under a stereomicroscope. The residual calculus on the root surface of each tooth was measured using a computerized Image Analysis System. The quantities were then compared in a two-way ANOVA and Chi-Square test. The results showed that following treatment an average of 46.3% of all root surfaces had residual calculus and the mean percentage of residual calculus per root surface was 4.408% following root planing. Forty percent of the root surfaces in Group 1 had residual calculus, 38% in Group 2 and 61% in Group 3. There was no significant difference detected between Group 1 and 2. However, there was a statistically significant difference ($p<0.01$) between Groups 1 and 2 as compared to Group 3. The mean percentage of residual calculus per root surface was also calculated for each group. The mean for Group 1 was 3.03%, Group 2 was 3.04% and Group 3 was 7.15% . Significant differences ($p <0.005$) were found between Groups 1 and 2 as compared to Group 3. These results indicate that subgingival calculus removal in deep pockets is enhanced with short term pocket distention and there is no added benefit to having aluminum sulfate present in the retraction cord.

949 EDTA Etching as an Adjunct to Nonsurgical Root Planing
J. BLOMLÖF*, L. BLOMLÖF, S. LINDSKOG (Dep. of Oral Histology, Karolinska Institute, Stockholm and Public Dental Service, County Council, Stockholm, Sweden)

Lately, etching agents working at low pH (pH 1) such as citric or phosphoric acids have been challenged by a chelating agent, EDTA (pH 7), as an adjunct during periodontal surgery. Experimentally, it has been reported that EDTA is equally effective compared to citric or phosphoric acids with respect to removal of smear and superior with respect to exposure of collagen fibers, early cell and tissue attachment and periodontal wound healing. Futhermore, EDTA has been shown to be biocompatible to periodontal cells and tissues in contrast to citric or phosphoric acids. However, despite numerous reports concerning root surface etching during surgical procedures less attention has been given removal of smear and exposure of collagen following nonsurgical approaches.

The purpose of the present study was to investigate if a subgingivally applied EDTA gel preparation has any smear removing and collagen exposing effect after nonsurgical root planing. 24 periodontally involved teeth scheduled for extraction were used in the study. The teeth were randomly divided into 4 groups, each containing 6 teeth. The first group of teeth were root planed and then extracted. The second group of teeth were root planed, etched with an EDTA gel preparation for 2 mins and then extracted. The third and fourth group of teeth were treated as group 1 and 2 respectively and rinsed in 1% trypsin solutions for 20 mins after extraction. All groups of teeth were then prepared for and evaluated with scanning electron microscopy.

Root surfaces, which were not trypsinized (groups 1 & 2) were completely covered by erythrocytes entrapped in a fibrinous network obscuring the root planed dentin surfaces. All root planed and trypsinized surfaces (group 3) were covered by a homogenous smooth smear layer. The root surfaces which were root planed, etched with EDTA and trypsinized (group 4) showed readily visible dentin surfaces as evidenced by lack of smear and with an abundance of patent dentinal tubuli. In high magnification these intertubular fibers displayed the cross-striated texture typical for collagen fibers. Etching of root planed surfaces with EDTA may thus enhance the effect of nonsurgical root debridement in the same way as has been shown during experimental surgical procedures.

950 **Review of Preemptive Analgesia for Dental Pain.** R. A. DIONNE,* (NAB, NIDR, NIH, Bethesda, MD)

Surgical and dental procedures often result in postoperative pain secondary to tissue injury and the initiation of the inflammatory response. Sequelae of inflammation such as pain and edema continue for several days after the initial injury due to sensitization of peripheral nociceptors and a self-perpetuating cascade of biochemical mediators of pain and inflammation. It has also been recognized that a barrage of nociceptive information can cause changes in the CNS, characterized as central sensitization, leading to increased pain for several days following the initial injury. Knowledge of these mechanisms suggests that attempts to prevent pathophysiologic mechanisms in the periphery and CNS may result in less pain in the immediate postoperative period as well as two-three days postoperatively when pain and edema usually peak. Pre-surgical administration of an NSAID has been well-documented to suppress pain on the day of surgery in comparison to a variety of analgesic drugs. Use of a long-acting local anesthetic, e.g. bupivacaine or etidocaine, suppresses pain to a lesser extent during the immediate postoperative period. Combining NSAID pretreatment with a long-acting local anesthetic results in an additive suppression of postoperative pain, with many patients reporting little or no pain following the removal of impacted third molars. Administration of a local anesthetic to patients undergoing a surgical procedure under general anesthesia has been demonstrated to suppress pain at 24-72 hours postoperatively in a variety of different types of surgery including oral surgery. Animal models suggest that administration of drugs which block the effects of excitatory amino acids at the N-methyl-D-aspartate (NMDA) receptor may be effective for blocking the development of central sensitization. **The scientific basis for preemptive analgesia will be reviewed and strategies presented for using currently available drugs to suppress acute dental pain by interfering with both peripheral and central processes leading to sensitization and postoperative pain.**

951 Dose-Ranging Analgesic Efficacy and Safety Study of Bromfenac Sodium. E.V. HERSH*, S.A. COOPER, N. BETTS, L. LEVIN, D. WEDELL and C. LAMP. (UNIVERSITY of PENNSYLVANIA).

Bromfenac sodium (BROM) is a non-narcotic analgesic structurally related to ketoprofen and diclofenac. The purpose of this randomized, double-blind, single-dose study was to evaluate the analgesic efficacy, safety and pharmacokinetics of 5 graded doses of BROM in patients following the removal of impacted 3rd molars. The treatment groups included PLACEBO (n=21), BROM 5 mg (n=21), BROM 25 mg (n=20), BROM 50 mg (n=20), BROM 100 mg (n=20) and BROM 200 mg (n=21). Ratings of pain intensity and pain relief were performed at 15 min, 30 min, 60 min, 90 min and 120 min, and then hourly for the remaining six hours. Blood samples were also drawn at these time points. All doses of BROM, except 5 mg were significantly superior ($p<.05$, ANOVA) to PLACEBO for all summary efficacy measures (3 and 8 hour SPID, TOTPAR and SPAID). Peak analgesic effects did not increase beyond the 25 mg dose of BROM. However, BROM 100 mg and BROM 200 mg displayed a quicker onset and longer duration than either the 25 mg or 50 mg dose. Plasma concentrations correlated with analgesic activity. The C_{max} ranged from 0.4 ug/ml for BROM 5 mg to 20.3 ug/ml for BROM 200 mg. Peak analgesic effects occurred at blood levels between 0.7 ug/ml and 2 ug/ml. The side effect incidence of the BROM groups was similar to PLACEBO. We conclude that BROM is a safe and efficacious analgesic with a threshold dose of 5 mg and a positive dose-response up to 100 mg. Supported by a grant from Wyeth Ayerst Research.

952 Amitriptyline as an Adjunct to Postoperative Analgesia in 3rd Molar Extractions. W. WYATT* (Creighton University School of Dentistry).

Amitriptyline has been proposed to be administered post-operatively to potentiate analgesic effects and reduce adverse side effects following 3rd molar extraction surgery. The purpose of this study was to evaluate the post operative course of patients receiving amitriptyline (50 mg.) in conjunction with an analgesic preparation compared to a control receiving the analgesic alone. 32 patents were randomly assigned to control and experimental groups. Surgical removal of 3rd molars was performed using IV sedation (titrated meperidine and diazepam) and local anesthetic. Each participant was given an analgesic (dihydrocodiene 32 mg. with ASA 356 mg. and caffeine 30 mg.) immediately after surgery. The control group received a placebo in addition to the analgesic and the experimental group received amitriptyline. Patients were instructed to take the analgesic and placebo/amitriptyline before bed the evening of the surgery. A written questionnaire was completed at the evening remedication documenting the level of pain and time of medication. A second questionnaire was completed 24 hours post-op exploring their satisfaction with the previous nights sleep, satisfaction with the analgesic, the number of capsules of medication left and any side effects. The data was analyzed using a Kruskall-Wallis ANOVA test and the Duncan's Multiple Comparison test. There was a statistical difference ($p<0.05$) in the number of side effects reported in the control group (19 reported by 12 patients) compared to the patients receiving amitriptyline (4 reported by 4 patients). 7 instances of nausea were reported in the control group and none in the experimental group. The results of this study indicate that amitriptyline administered in combination with a narcotic analgesic reduces adverse side effects following 3rd molar surgery. The mechanism of action may be the mild sedative characteristic and enhanced H_1 blocking effects of this drug combination.