

What's new in dentistry

As orthodontists we are often unaware of the technical and methodological advances in other dental specialties. However, many of these new experimental developments may ultimately become accepted dental therapy and influence the diagnosis and treatment of our orthodontic patients. Therefore, as part of the dental community, we must keep abreast of current information in all areas of dentistry. The purpose of this section of The Angle Orthodontist is to provide a brief summary of "What's new in dentistry."

By Vincent Kokich, DDS, MSD

DO YOU PRESCRIBE ANTIBIOTICS FOR PATIENTS WITH HEART MURMURS? — Certain dental procedures that cause bleeding of the gingiva and mucosa intraorally commonly cause transient bacteremia that persists for about 15 minutes. This is rarely a concern in most patients. However, if patients have abnormal or damaged heart valves, certain bacteria may lodge in these valves and cause bacterial endocarditis. As orthodontists, we have not worried about this problem. However, the American Heart Association recently published their 1990 recommendations for the prevention of bacterial endocarditis. It is important that all dentists be aware of the minimum guidelines. They were published in the *Journal of the American Medical Association* (264:2919-2922, 1990). Antibiotic prophylaxis is recommended for all dental procedures likely to cause gingival bleeding, including professional cleaning. For the orthodontist, this would include banding and band removal. In the guidelines, the committee states that simple adjustment of orthodontic appliances does not present a significant risk of endocarditis, and therefore, antibiotic prophylaxis is not necessary. For patients who are at risk during banding and debanding, the recommended standard prophylactic regimen is amoxicillin. Individuals who are allergic to penicillin should be treated with erythromycin. Tetracyclines and sulfonamides are not recommended for endocarditis prophylaxis. The standard regimen for the patient at risk is 3.0 gm orally 1 hour before the procedure, and then 1.5 gm 6 hours after the initial dose. Antibiotics over extensive periods of time following the pro-

cedure are not recommended since the bacteremia is not long-lasting.

NERVE GROWTH FACTOR EFFECTIVE AT REGENERATING SENSORY NERVES — Have you ever had a patient who had numbness of the lower lip after mandibular surgery? This is a rather common sequelae to mandibular surgery, and fortunately, this side effect is usually short-lived. However, occasionally the mandibular nerve may be severed during the osteotomy, resulting in a permanent paresthesia to the lower lip and buccal gingiva on the affected side. However, researchers are experimenting with a method of regenerating severed sensory nerves. Some preliminary data from these studies were published recently in the *Journal of Oral and Maxillofacial Surgery* (49:61-69, 1991). In this study, Dr. Barry Eply and his surgical colleagues from Indiana University tested the use of a peripheral nerve regeneration factor, called nerve growth factor, in rabbits. They severed the mandibular nerve on the right and left sides in each of the rabbits and attached a piece of silicone tubing to the cut ends to provide a path for the nerve to regenerate within. On one side, they also injected nerve growth factor into the silicone tubing. When they re-evaluated the animals after sufficient time, they found that all the nerve repairs that were injected with nerve growth factor exhibited tissue which histologically showed regeneration of nerve axons. The control side showed no nerve regeneration. In addition, the regenerated nerve fibers were able to conduct electrical stimuli. Although the human application of this experiment is

still in the future, this nerve regeneration factor will hopefully be successful in human patients.

XYLITOL CHEWING GUM REDUCES CARIES

— Orthodontists know it is much more difficult for patients to clean their teeth when appliances are in place. Therefore, we are interested in new ways of eliminating — or at least limiting — the amount of plaque that forms on the teeth and the progression to dental decay. In recent laboratory experiments, researchers have found that sugar substitutes such as xylitol and sorbitol actually reduced the numbers of caries-producing bacteria as well as the formation of plaque and acid production by the plaque. In order to test whether or not this effect would be clinically significant, researchers then placed xylitol in chewing gum and carried out a 2-year study on a population of 275 elementary school children with a high caries rate. The results were published in the *Journal of Dental Research* (69:1771-1775, 1990). There were three groups of individuals in the experiment. Two experimental groups received xylitol-containing chewing gum in school every day. The chewing gum was distributed three times a day by teachers who supervised a 5-minute chewing period. One experimental group received chewing gum containing 65% xylitol; the other group received chewing gum containing 15% xylitol. A third group of children was used as a control. The number of decayed surfaces was evaluated after 1 year and 2 years. In the experimental groups, there was a 55% reduction in the progression of dental decay during the first year, and in the second year a 65% reduction compared to the control group. This study suggests that the regular use of chewing gum containing xylitol shows an impressive reduction in caries incidence in school-aged children.

COMMON HIGH BLOOD PRESSURE MEDICATION CAUSES DILANTIN-LIKE GINGIVAL HYPERPLASIA

— Orthodontists are acutely aware of the potential problem dilantin poses for patients with bands and brackets on their teeth. Significant gingival hyperplasia can occur secondary to plaque accumulation in these patients. Now it appears that another drug may cause the same effects. Nifedipine, a long-acting vasodilator that is widely used for cardiotherapy may be more widely used than dilantin. Its main effect is to relax cardiovascular smooth muscles and it is primarily used in patients with hypertension. Since orthodontists are treating more adults, we will probably run across patients who are taking this drug. The authors of an article in the *Journal of Periodontology* (62:30-35, 1991), describe two alternatives for reducing gingival overgrowth. One

possibility is to have the patient placed on a different hypotensive diuretic. When this is done, there is usually spontaneous regression of the gingival hyperplasia without any periodontal therapy. In some patients, however, the nifedipine is critical to the patient's cardiac care and intensive periodontal therapy including periodontal surgery and excision of the hyperplastic gingiva is necessary. When patients treated in this manner maintain good plaque control, the gingival overgrowth does not recur in spite of the continued use of nifedipine. In adult orthodontic patients taking nifedipine, therefore, either changing the drug or intensive periodontal maintenance will be necessary to avoid gingival hyperplasia.

POSTERIOR COMPOSITE RESTORATIONS HAVE BETTER MARGINS THAN AMALGAM

— In the past, composite restorations were confined to the anterior teeth. However, with patients increasingly concerned with cosmetics, dentists are now placing composites as occlusal restorations in posterior teeth. Do these materials stand up as well as the traditionally accepted amalgam restorations? In early use, composite restorations were found to be unsatisfactory. However, recent hybrid materials that are 70% filled by volume are supposed to be more wear-resistant. But are these claims really true? Will orthodontic patients with posterior composite restorations have an increased likelihood of recurrent decay during 2 years of orthodontic treatment? A recent study in the *Journal of Prosthetic Dentistry* (64:523-529, 1990) compared posterior composite resin and amalgam in a 5-year long-term study. The study, completed at Southern Illinois University School of Dental Medicine, examined 62 patients with a total of 107 composite restorations and 53 amalgam restorations placed in their posterior teeth. Each individual had at least one of each type of restoration. The average age of the sample was 30 years. Each individual was recalled at least 5 years after the restorations had been placed. With the exception of marginal adaptation, no statistically significant differences were noted in the performance of the composite resin and the amalgam. The only statistically significant difference was found between the marginal adaptation data which showed that the amalgam actually had poorer margins after 5 years. With the continuing controversy over mercury leakage from amalgam restorations, we will probably be seeing more and more posterior composite restorations in the future. Apparently, if the proper composite material is used, these restorations can be as effective after 5 years as traditional amalgam restorations.