

Dentistry

Rick Weiss reports from Washington, D.C., at the American Dental Association/Federation Dentaire Internationale joint world congress

Cleaning cavities with a light touch

There's no vibration. No noise. And most important, no pain. The advantages of laser beams over drill bits are legion, says dental researcher Terry Myers. Although the use of lasers on teeth still awaits Food and Drug Administration approval, recently completed clinical tests went so well he expects approval within "maybe three to six months."

Myers, a dental consultant to American Dental Laser, Inc., in Birmingham, Mich., reported results from 150 teeth in 100 patients who had cavities in the enamel, or outer layer, of their teeth. The Nd-YAG laser — which has at its core the rare-earth element neodymium grown on a crystal of yttrium-aluminum-garnet — vaporizes soft organic material in dental cavities, but is too weak to damage healthy enamel, he says.

Carbon dioxide lasers, already approved for gum surgery, get too hot for use on teeth, irreversibly damaging the delicate inner pulp. By pulsing the Nd-YAG beam 10 times per second, a dentist can keep the tooth cool enough to prevent such damage. And with each pulse lasting only 30 trillionths of a second — less than a hundred-millionth the time necessary to trigger a pain nerve — the surgery is essentially without sensation except for a feeling of warmth or tingling reported by 10 to 15 percent of patients. "We've never needed any anesthetic," Myers says, noting that the vibration and whine of the old-fashioned drill bit — often interpreted by patients as pain — are also nonexistent in laser dentistry.

Just don't stick it under your chair

Schoolteachers may not be pleased with the latest dental research demonstrating significant advantages to chewing gum. Recent research shows the copious production of saliva stimulated by gum chewing helps neutralize the tooth-decaying acids in dental plaque. Now researchers are focusing on the ideal timing of gum chewing.

Bruce R. Schemehorn, Kichuel K. Park and George Stookey of the Indiana University School of Dentistry in Indianapolis fitted patients with removable partial dentures with built-in pH electrodes for continuous monitoring of plaque acidity. Acidity was best neutralized above the "danger limit" of pH 5.5 when gum chewing began within 5 minutes after a meal and lasted at least 15 minutes. "If you can brush, that's best," says Park. "But if you can't, then chewing gum is an alternative we can recommend."

The researchers found that plaque acidity from starchy snacks — especially corn chips — lasts longer than that from sucrose (table sugar) snacks. There's even a hint that something in cocoa makes chocolate protective against acidity. Snacks that don't seem to promote much acid plaque: peanuts and popcorn. The "healthy" snack that does: raisins, because they're acidic and sticky.

Sweet defeat for dental caries

Controversy continues over the relative dental risks and benefits of various sweeteners in gum. But a growing body of evidence suggests that xylitol, a nonfermentable sugar alcohol popular in some European gums but not common in the United States, has a definite *protective* effect on teeth — perhaps by killing harmful bacteria and stimulating remineralization on tooth surfaces. A study in the August *JOURNAL OF THE AMERICAN DENTAL ASSOCIATION*, conducted by Kauko Mäkinen of the University of Michigan School of Dentistry in Ann Arbor and his colleagues, shows that kids who chewed xylitol-sweetened gum three times a day for two years developed significantly fewer cavities than did classmates who chewed non-xylitol gum. And new research reported by Mäkinen last week suggests xylitol's protective effects continue two years after the kids stop chewing it.

Environment

Pesticide bill prompts mixed reviews

Embodying 16 years' worth of attempts at compromise between the agricultural-chemical industry and environmental groups, a bill to amend the Federal Insecticide, Fungicide and Rodenticide Act of 1972 could become law as soon as this week. Congress approved the revision late last month, and observers in both camps expect the President to sign the bill, which reached his desk Oct. 14.

Although industry representatives express general satisfaction with the bill, some environmentalists say the amendment contains a minimum of new regulation and might even provide Congress with a hiatus from having to deal with contentious issues involving pesticides and public health.

Under the new bill, the Environmental Protection Agency would have nine years to complete testing of about 600 key ingredients used in thousands of pesticides, and would no longer compensate manufacturers for chemicals removed from the market.

W. Scott Ferguson of the National Agricultural Chemicals Association in Washington, D.C., maintains "there should be a corresponding federal effort to get new products on the market." But he says he expects "the products that will be lost will be marginally profitable ones, and the products left will be more thoroughly researched and tested."

Ferguson says the three-year term of the amendment — beginning Sept. 30, 1989 — will give the industry time to create safer products to replace some of those discontinued. But Thomas L. Oates of the National Coalition Against the Misuse of Pesticides, based in Washington, D.C., says the duration of the bill postpones the need for Congress to make tough decisions about such problems as how to stem groundwater contamination and protect farm-worker health.

The bill passed Congress, Oates says, specifically because it avoids these issues. But, he adds, "I suspect there will be a separate bill on groundwater soon because it is a strong public concern." Legislation safeguarding workers who touch and breathe agricultural chemicals may emerge more slowly, says Oates, because few laborers know of the potential risks of handling the substances.

More specie for endangered species

President Reagan signed into law Oct. 7 a bill authorizing an increase in federal spending for the protection of endangered and threatened species worldwide. Amending the original Endangered Species Act of 1973, the bill increases annual funding for plant and animal protection from about \$30 million currently to \$66 million by 1992.

Provisions of the bill include raising from \$20,000 to \$50,000 the maximum fine for violating the act, and using the first \$300,000 collected in fines to reward informants who notify the U.S. Fish and Wildlife Service of poaching and other criminal activities affecting endangered species. The bill also makes illegal the removal of endangered or threatened plants from any property in the United States without written consent of the land owner.

"We're very happy with the bill," says John M. Fitzgerald of Defenders of Wildlife in Washington, D.C., the lead conservationist group that worked for passage of the bill. He says its mandate for involving local and regional agencies "will make cooperation between states and the federal government easier."

Opponents of the act believe it overemphasizes the need to lengthen the endangered species list, says Sen. Jake Garn (R-Utah), the only senator other than Sen. Steve Symms (R-Idaho) who voted against the bill. Garn says he would like to see the already-listed species protected before others are added to the register.