

medical sciences

DENTAL CARIES

Chemicals to eliminate cavities

A calcifying solution containing calcium and phosphorus in concentrations similar to those in saliva may eliminate the need for artificial fillings, says a University of Iowa dental researcher.

Speaking at a meeting of the International Association for Dental Research in New York last week, Dr. Stephen Wei of Iowa's College of Dentistry reported that the solution almost completely remineralized cavities in their early stages. This supports the concept that dental decay may be a reversible process in which developing cavities are actually chemically repaired.

In the study, Dr. Wei subjected freshly extracted teeth to a weak acid for 40 hours to demineralize and soften their outer enamel surfaces. The enamel was then remineralized and rehardened by immersing the teeth and artificial solution for five days.

Results showed that calcium and phosphorus were almost completely recovered in the remineralized enamel, and the end product closely resembled that of normal enamel in chemical composition. Moreover, Dr. Wei states, the microhardness of the enamel was also partially restored.

CANCER

Blood test studied

One of medical science's goals has been to achieve an early detection test for cancer. Recently, Drs. Sam Freedman and Phil Gold of Montreal General Hospital found a tumor-specific antigen in the blood of all patients with colon cancer.

In patients treated successfully for their cancer, the Carcinoembryonic Antigen disappeared from the blood. In those in whom the cancer had spread, CEA remained in the blood.

By means of an immunologic test, called the Gold test, the antigen can be detected in a blood sample.

The American Cancer Society and the National Cancer Institute of Canada have offered grants to three United States medical centers and two Canadian medical centers to refine the test and expand its application to early detection.

PULMONARY EMBOLISM

Heart-lung machine for clots

Massive blood clots collecting in the blood vessels leading to the lungs are fatal in 22 percent of patients almost immediately, in 47 percent within 15 minutes and in 62 percent within the first hour. Surgery, consisting of tying off the major vessels at the site of clotting, or removing the clots, is life-saving in only 30 percent.

An experimental technique in which a heart-lung machine sucks the clots through a large catheter passed from the right external jugular vein in the neck into the main, left or right pulmonary arteries, has been recently described by a University of Southern California surgeon.

Using the machine, Dr. Jerome Harold Kay tested the method on 20 anesthetized dogs in the surgical cardiovascular research laboratory of the USC School of Medi-

cine. He reports that 95 percent of the dogs survived, and in 75 percent it was not necessary to open the chest.

Although the method has been attempted on only one person, a 27-year-old woman who survived, Dr. Kay believes that the method should be logical in treating patients with pulmonary clots. "The method is simple, flexible, reliable and can be applied rapidly within 10 or 15 minutes after the embolus has occurred," he says.

ANESTHESIOLOGY

Electric shock for anesthetic

Many anesthetic agents are not only potentially toxic, but take a while to be eliminated from the body. Electric current passed through the brain produces unconsciousness and loss of pain in a way that makes it a candidate for use in surgery.

Dr. John Waycott of the Imperial Chemical Industries Research Laboratory in Alderley Park, Cheshire, England, says electric shock will be used as an anesthetic in the not-too-distant future. A fully conscious patient will be wheeled into the operating room, placed on the operating table, have electrodes placed on his head, and the current switched on. The patient will immediately and painlessly be ready for the operation. After the operation, the patient would be returned to his bed, and the current switched off, at which point he will immediately awaken. Although this procedure may be attractive, certain complications encountered must first be eliminated. When the current is too strong, muscle spasms can result, necessitating the use of muscle relaxants. If the lungs are affected, artificial ventilation must be produced.

Dr. Waycott feels that further research to determine the proper wave forms and currents and to find which part of the brain the electricity should travel through will eventually eliminate these complications.

CIGARETTES

Smokes without tobacco

British man-made fiber companies are making steady progress with tobacco-less cigarettes, in the hope that they may be free, or at least freer, of medical risk. A research team at Coventry in England has produced several brands that have been tested by smokers, whose verdict was smokeable, but different. Another team, sponsored jointly by the Imperial Chemical Industries and Imperial Tobacco, is working in the same direction but is not confident of producing anything salable for several years.

Although both teams are keeping the ingredients secret, the basis seems to be cellulose—the main constituent of paper. Other organic ingredients are probably being added to bring the taste level up to that of tobacco.

The synthetic cigarettes cannot be marketed until animal tests have shown they are free from dangerous materials, and, in the United States, the National Clearing House for Smoking and Health feels this may take several years. Certain hydrocarbons that are responsible for cancer may be liberated on combustion so that what hydrocarbons are elicited by the synthetic cigarettes must first be compared with those from tobacco smoke.