
News Release

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COMPUTER-ASSISTED DEVICE
COULD REPLACE TRADITIONAL METHODS OF RESTORING TEETH

Washington, D.C. -- A computer-assisted device that can design and produce crowns and dentures in a fraction of the time required by traditional methods is working its way into dental offices, a dental educator said today at the 129th annual session of the American Dental Association.

The CAD/CAM (computer-assisted design/computer-assisted manufacture) system could eliminate the need for dental impressions, decrease production time by eliminating the need for a dental lab, and limit the patient to one office visit in many cases, according to Jack D. Preston, D.D.S., professor of esthetic dentistry at the University of Southern California.

The device was developed by Francois Duret, D.C.D., Ph.D, a copresenter at the session. Although now only used for crowns and bridges, "the potential for other uses is great," Dr. Preston said. The CAD/CAM is a "major departure from traditional dentistry. It is an example of what the future of dentistry will be."

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The CAD, or optical part of the device, includes a laser/scanner that replaces dental impressions with three-dimensional measurements and detailed design of teeth to be treated.

The CAM is a micro-milling machine. About the size of a personal computer, the CAM cuts the solid block of material from which used replacement teeth are made according to the detailed measurements of the CAD unit. Both units are linked through a centralized computer "brain."

The process to fabricate a single crown, for example, begins by using the optical probe to take computerized measurements of the tooth that needs treatment. These measurements are stored in the computer's memory. The tooth is then prepared by the dentist in the traditional manner for placement of the crown. A second set of measurements is taken of the prepared tooth and also stored in the computer's memory.

The computer, with instructions from the dentist, designs the individualized crown by comparing the two sets of tooth measurements to the computer's pre-programmed "ideal" tooth. The ideal tooth image is altered through an image processing system that calculates the dimensions needed to make the crown for a particular individual.

These dimensions are sent to the milling machine via a digital controller. Operating through the computer, the digital controller directs the milling machine's saw to make the crown. Final polishing is done by the dentist.

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