

## Computer Magic in the Dentists Office

**New York, N.Y., May 19, 2003** — Dental patients will no longer have to wait two weeks or more for new crowns, veneers and fillings thanks to some movie-like magic being introduced to dentists' offices this month. New computer software can now convert a single photograph of a tooth needing repair into a futuristic three-dimensional image, which is then immediately transformed into a perfectly-shaped real tooth.

The computer technology is called CEREC, manufactured by Germany-based Sirona. Through a process called "Computer Aided Design/Computer Aided Manufacture" (CAD/CAM), dentists convert a digital photo into a microscopically accurate "optical impression" of the tooth. After some minor tweaking, the image is electronically sent to a second machine that grinds out the restoration right there in the dentist's office.

"It's literally like a scene out of the movie, 'The Matrix,'" says Dr. Clifford Williams, whose Manhattan office is one of the first in the Metro New York Area to have the technology. "The unique software transforms one digital photo into a 360° image that I can turn around and look at from any direction."

### A FRACTION OF THE TIME

According to Dr. Williams, a dentist normally has to go through the process of taking a physical impression of the tooth, creating a mold, sending it off to a lab and, when it comes back in a couple of weeks, hoping that it fits and the color is right. "If any one of those things goes wrong, whether by human error or technical error, we have to start the whole process all over again," he says. "Well, something is wrong 10 to 20% of the time, and that means another two weeks."

"The ability to generate a digital image and produce an actual tooth in-office, however, will boil down what was once a two-week, multi-visit process to about an hour and a half," says Dr. Williams. "A single sitting also means the pain and discomfort of just one shot of Novocain, instead of getting a new dose each visit."

### HOW IT WORKS

The process occurs in just a few steps. First, the tooth is prepared to receive the new restoration by removing areas of decay, including any old or broken fillings or caps. Next, the dentist takes a photo of the prepped tooth using a small, specially-designed digital camera attached by a wire to the CEREC computer. Then the new software transforms the photo into a color, three-dimensional image that the dentist fine-tunes to create the final design of the crown, inlay or other restoration.



"However, if the old cap or filling has a good shape, we may take an additional photo, one of the tooth before preparation and one after," says Dr. Williams. "We'll then superimpose one picture on top of the other – called the correlation model technique – and come up with the tooth design."

Next, the dentist takes a tooth-colored ceramic block from among hundreds of colors and sizes and places it into the in-office milling machine, which resembles a box with two diamond-tipped drills inside. The final tooth design is transmitted to the milling unit, and the two diamond cutters move around the block and carve out the tooth.

"From there, we just do the final fitting of the restoration onto the tooth," says Dr. Williams. "Once we know it fits, we take a fine-grit diamond drill bit and polish and shape the tooth to perfection. And the ceramic material is greatly superior to anything else out there as far as strength and fit are concerned, including silver or composite fillings."

#### SO LONG, TEMPS

The other advantage of the in-office CAD/CAM process is the elimination of the temporary caps and inlays patients otherwise have to wear between visits. "Temporaries fall out 10 to 15% of the time and for many, that means yet another trip to the dentist to have it repaired," says Dr. Williams. "If patients don't get the temp fixed, they may develop pain and/or an infection. And without the temp there to brace it, the tooth can even shift and cause the dentist to have to take an entirely new impression and start the whole process over again."

#### ABOUT DR. CLIFFORD WILLIAMS

Clifford Williams, DMD, FACD, is one of the nation's top dentists specializing in restorative and aesthetic dentistry. Located in the heart of Manhattan in Rockefeller Center, Dr. Williams is a leader and innovator among his peers in dental implants, crowns, porcelain veneers, bonding, bleaching, and many other medical and cosmetic procedures. He is one of a select few dentists voted by his peers to enter the elite American Academy of Restorative Dentistry.

He is a consultant to several dental companies including BRS Computing, Caulk/Densply Corporation, Pain Suppression Laboratory, Online Computers, Americus Dental Laboratory and MHT International Dental Lab. In addition, Dr. Williams is the High Technology Editor of Periodontal Practice and Aesthetic Dentistry magazine and author of dozens of articles on dental technology and advancements. He is also a nationally recognized presenter and speaker on new techniques and technology.