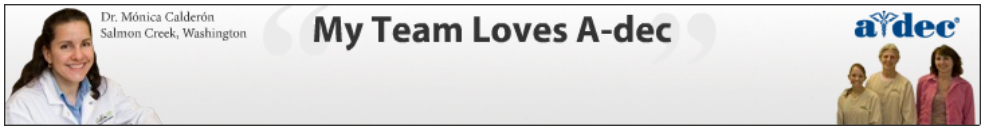

HotOptimize Beta
Business Criteria
Dentist production per hour
Zip code
Powered by Sikka
Search

BOOKMARK | Add RSS Feed

A New Era in Caries Detection

April 3, 2007
By Jean Furuyama, DDS, FAGD, FADI

It wasn't all that long ago when the mirror and explorer were standard for detecting occlusal caries. They were fine in the days before fluoride when teeth were often so bombed out with decay that it made sense to follow G.V. Black's recommended "extension for prevention."

Since fluoride, the nature of decay has changed. Now small pinholes are often the only indication of decay. Without magnification, visual inspection can lead us to miss even serious decay. I remember opening up what seemed like a small cavity only to find that it had already spread all the way down to the pulp. (I am sure you have all had that experience.) I went back to look at the X-ray and realized that I didn't even catch it. How do we miss decay so bad that it goes all the way to the nerve? Because X-rays routinely miss between 70 percent to 80 percent of occlusal caries.

Fortunately, several new ways to detect caries are available. Low-tech methods such as CARIES DETECTOR **www.kuraraydental.com/viewproduct.php?cid=3** and other dye products are helpful in differentiating sound dentin from caries and in determining when to stop drilling during caries excavation. If you aren't using it, you should. You will be surprised how much decay you thought you were getting out but were actually missing. And once you start using it, you will also discover a big decrease in your patients' post-op pain.

A few years ago, KaVo **www.kavousa.com/** introduced a diagnostic tool called the DIAGNOdent **www.kavousa.com/products/handpieces_accessories/special_instruments/diagnodent/diagnodent.asp?navid=311000&lan=Us**, which detects decay by measuring fluorescence. The device pulses a red diode laser beam of 655 nm wavelength and reads the light reflected off the tooth. By measuring only the pulsed reflection, it filters out ambient light and gives a reading based on the amount of fluorescence that the device detects. It is the porphyrins in the bacterial waste products that cause the laser beam to fluoresce — the more bacteria, the more the fluorescence. The device emits an audible beeping sound that gets louder as the amount of fluorescence increases.

Things can give you false positives: fluorosis, decalcified white spots, plaque, and prophy paste. It is important to use only pumice to clean the teeth before scanning. It is also a matter of clinical judgment when to watch incipient decay and when to surgically enter a tooth to place a filling. I go in for any reading greater than 17 — which is lower than many people — but I have invariably found that the decay is already into the dentin at that reading. Once the decay is into dentin, I don't watch. But if your philosophy is to watch, DIAGNOdent gives you the means to record the readings and watch it by having a numerical standard against which you can measure.

KaVo has recently come out with a new type of cordless pen that essentially does the same thing as the original model they still market. I prefer the original model because I think it involves patients more in co-diagnosis. I have them place the unit on their chests while I scan their teeth. They hear the beep (they do with the new pen model, too), and they see the numbers on the readout. The numbers seem more convincing for the average patient because people process visual information better than auditory information.

QLF™, marketed in the United States as the Inspektor Pro by Omni **www.inspektor.nl/dental/qlfmain.htm**, is another technology for detecting caries. Like DIAGNOdent, QLF measures fluorescence. The difference is that QLF software allows you to download the fluorescence readings into a computer program. QLF stands for quantitative light-induced fluorescence. You can see an image of the tooth and identify on the screen where the decay is by a difference in color. Healthy enamel shows up as green and decay as red. The computer analyzes the severity of decay, location, and depth. It is three times more effective in identifying decay than the explorer and has a sensitivity of 92 percent. The downside is that it is expensive (around $25,000 vs. $4,000 for DIAGNOdent) and takes almost 25 minutes for a well-trained person to do a scan because you need to line up each scan exactly with the same orientation and distance from the tooth as the original scan or the device will not let you record the image. This assures that the readings are consistent, but it can be difficult to line up each image. The device is really more useful for research than clinical practice, but if you believe in watching incipient decay, it is an incredible tool.

The latest tool for caries detection is the D-Carie by neks™, **www.neks.ca/d-carie_en.htm**. It is also designed for occlusal and smooth surface detection and measures the difference in refraction of healthy enamel compared to disrupted crystalline structure in decayed enamel. When the probe finds an area of decay, the

Woman Dentist Journal

July 2008

- Current Issue
- Issue Archive

Resource Center

- Oral Cancer Prevention Center
- Dental Continuing Education
- Dental Practice Management
- Under One Roof Blog
- From The Editors Blog
- Download Center
- Buyers Guides
- Media Kit
- White Papers
- MSDS Sheets
- Application / Technique Guides
- Classified Ads

WOMAN WDJ DENTIST eJOURNAL
Your exclusive source for Connecting Women in Dentistry

Woman Dentist Journal

Looking for more news and information? Search our archives. Click here!

RECENTLY ARCHIVED ARTICLES
AAWD chronicle Newsletter
Building a Better You: Fortune Cookies & EQ
CE Course: Modern Perspectives in Root Canal Obturation
Editor's Note: [Know Your Numbers?]
It's all about the SEX!: When it comes to health, your sex matters.

Interested in a subscription to Woman Dentist Journal Magazine? Click Here to subscribe!

XML RSS Click Here to subscribe to the Woman Dentist Journal Feed.

WOMAN WDJ DENTIST eJOURNAL
Your exclusive source for Connecting Women in Dentistry

Introducing TECO™
Total Etch Control
Bonding Agent
ZenithDental
click here for FREE sample

The spot for the latest oral care
special offers
Crest Commit Gly-Oxide

probe tip lights red and the device makes a buzz that gets louder as the decay gets deeper. The probe is so small it looks like a sickle scaler and is easy to use and requires no calibration. Although not yet approved for interproximal detection in the United States, it is being used in Canada for this purpose, and the small tip should make it possible to use interproximally. The probes for both DIAGNOdent and Inspektor Pro are too large to get into these tight areas. In addition to being small, D-Carie's beam penetrates deeper than other devices. Selling for less than $3,000, D-Carie is an exciting tool to add to your armamentarium.

The only device that has been approved by the FDA for detection of interproximal as well as recurrent decay is DIFOTI®, **www.difoti.com/**, which stands for Digital Imaging Fiber-Optic Trans-Illumination. Similar to an intraoral camera, the device projects a real-time image on a computer screen. Unlike the intraoral camera, which projects reflected light, the DIFOTI projects refracted light. When you shine the light through a tooth, the areas of broken enamel rods refract the light differently than intact enamel so you can see decay. You can also see under and around old fillings to detect recurrent decay, which none of the other devices are cleared to do.

Compared to traditional X-rays, DIFOTI is far more diagnostic and detects decay much earlier. Before DIFOTI, 70 percent of caries went undetected because X-ray beams are so strong that they pass right through teeth and can only detect caries when enough tooth structure has been lost to give enough contrast in densities to be read on the film or digitally. DIFOTI is a much lower-power light that goes through and around teeth so differences in light refraction are easier to see.

Patients love DIFOTI because it is painless, has no ionizing radiation, and is easy for them to understand. It shows incipient decay as well as decay under sealants, around old fillings, and between teeth. Intraoral cameras don't show these areas as well, especially between teeth. For new patients, it builds immediate trust and they want to take care of their cavities then and there. You couldn't ask for a better practice-building tool, or a better diagnostic one.

DIFOTI does not allow you to quantify caries as DIAGNOdent and QLF do, but it does allow you to capture the images and store them in the computer for later comparisons. It also does not detect decay under crowns or the gingiva, so you still need X-rays. It requires some clinical judgment because it occasionally can give false positives, as all of these devices can in the presence of fluorosis, heavy plaque or calculus, or enamel hypoplasia. I have been using DIFOTI and DIAGNOdent for more than two years, and I rarely get false positives, but I have gotten false positives in reading X-rays. In general, I am more confident with the DIAGNOdent and DIFOTI readings than I ever am with X-rays — digital or film.

What is in the future? Keep an eye out for ozone therapy. KaVo is already marketing it in Europe, and it may prove helpful with arresting caries so that products like MC paste can remineralize these areas and have the solution for eliminating caries. With the devices now on the market, we might be able to monitor caries well enough that we can confidently watch them. Who knows? Even I might change my philosophy and become a watcher.

References available on request.

*Jean Furuyama, DDS, FAGD, FADI, is a past president of AAWD and owner of Waterside Dental Group, PC, in New York City. E-mail her at **jfuruyama@aol.com**.*

BOOKMARK | Add RSS Feed

More April, 2007 Articles > **Search Archives >**

Pennwell Dental Group Article Categories:

Dental News **Dental Headlines**
Video News **Dental Products**
Industry News
Current Issue Table of Contents

Search Products Buyer's Guide >

Magazine & E-Newsletter Subscriptions >

PennWell Dental Group | Dental Economics | RDH | Woman Dentist Journal | Dental Office | Grand Rounds | Proofs | About Us | Contact Us | Media Kit
Dental Practice Management | Dental Continuing Education | Dental Events | PennWell | PennWell Sites | PennWell Events | Courage and Valor
Privacy Policy | Terms & Conditions | Site Map | Webmaster | RSS Feed XML RSS

Copyright © 2007: PennWell Corporation, Tulsa, OK; All Rights Reserved.

WDJ