# a keen eye for <section-header><text><text>

match and look sharp, while lowering the number of restorations needing repair. Doctors Nachum Samet, John Da Silva, and Shigemi Ishikawa-Nagai, of the **Harvard School of Dental Medicine.** explain how.

PRACTICE, achieving perfect esthetics is still challenging and frustrating for both dentists and patients. Now, there's a way to reduce that frustration.

A study has shown Crystaleye (Fig. 1) – a computerized color-matching device –improves a

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crowns that need to be revised, saving you and your patients time and effort with the tricky procedures. (Da Silva and Nagai et al, J Prost Dent.99:5:351-360, 2008)

Esthetic composite restorations aim to mimic the natural layers of a tooth. However, a restoration based on a single shade cannot replicate

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the natural optical properties of a tooth. Restorations, to look natural, must be fabricated from at least two layers: dentin shade composite materials to restore missing dentin tissues and enamel shade composite materials to restore missing enamel tissues.

Selecting the correct colors to match the natural tooth has been the difficult part. Different shade guides are in use, but they lack the ability to compensate for shades outside their prearranged schemes. And more advanced shadeselection techniques are only as



Fig. 1: A study has shown Crystaleye improves a dentist's ability to match the shades of restorations. It can reduce the number of crowns that need to be revised, saving you and your patients time and effort with the tricky procedures.

light source within the clinic, and the thickness of the layers used.

Dental technicians and ceramists have adopted techniques that look separately at the dentin shades, the enamel shades, the translucencies, and the intricate external and inter-

> nal shades of the tooth. Manufacturers of ceramic materials

good as the person using them, the have created "cookbook" recipes for the fabrication of certain shades. However, a creative and artistic technician can use these as guidelines and make changes as needed to compensate for specific shade challenges of a particular patient. Such "cookbook" recipes may help a clinician who fabricates esthetic composite restorations. But only a few companies came up with such recipes, and they apply only for a limited number of indications. Then, in 2007, Olympus Inc.

Fig. 2: Preparations Class III, IV and V.



Shade for tested tabs: IPS Chromascop: 010, 020, 030, 040, 140, 230, 330, 340, 410, 420 (10). Vitapan 3D Master: 1M2, 2M1, 2M3, 2L25, 2R25, 3M1, 3M3, 4M3 (8)

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(Japan) introduced Crystaleye. It revolutionized color-matching technology because of its unique ability to match shades, translucencies, and other optical characteristics of the tooth. Plus, the unit's sophisticated software package enables the clinician and the technician to view how similar (or different) a tooth is from a standard shade.

A study at the Harvard School of Dental Medicine was presented at the International Association



Fig. 3: A study has shown Crystaleve improves a dentist's ability to match the shades of restorations. When restorations were performed using the Crystaleve recipe, only 8% had to be corrected.

of Dental Research (IADR 2008) meeting in Toronto, Canada. The study was aimed at evaluating this novel, computerized colorrestorations in prepared standard shade-guide tabs. These shadeguide tabs required the fabrication of class III, IV, and V cavities, all

recipes obtained by using Crystaleye (shades and thickness for each of two layers). A visual evaluation for color matching was then per-

# IN 2007, OLYMPUS INTRODUCED CRYSTALEYE. IT REVOLUTIONIZED COLOR-MATCHING TECHNOLOGY BECAUSE OF ITS UNIQUE ABILITY TO MATCH SHADES, TRANSLUCENCIES, AND OTHER OPTICAL CHARACTERISTICS OF THE TOOTH.

matching technique, and comparing it to the conventional method of shade and composite selection.

Three experienced dentists and six fourth-year students (DMD-4) were asked to fabricate composite

with exposure to the buccal aspect of the tab (Fig. 2).

Each provider was asked to restore two sets of tabs based on his/ her own judgment of the selected shades; and two sets based on the



formed by six examiners, who were asked to use a scale of: excellent match; acceptable match; and poor match (which would essentially require redoing the restoration).

The results showed 22% of the composite restorations performed by experienced dentists had to be corrected, while 52% of the restorations fabricated by the students had to be corrected. But when restorations were performed using the Crystaleye recipe, only 8% had to be corrected (Fig. 3-4).

A new feature currently under development for Crystaleye will also enable clinicians to get a "recipe" for the fabrication of an esthetically correct composite restoration. The recipe will include information related to the shade suggested for each layer and the thickness of each layer.

The results and development show Crystaleye and its software could bring a new era to the dental practice, one where composite restorations can predictably accurately reproduce tooth shades.





# Easy-to-use technology

Capture images inside the oral cavity with just one click





