# Biomimetics in Your Office

By Saul Pressner DMD, FAGD

This article discuses in greater detail the clinical applications of Biomimetic Dentistry. As previously stated, Biomimetics refers to mimicking life. The term is derived from the Greek word bios for "life," and the suffix mimetic, "having an aptitude for mimicry."

The benefits of this type of dentistry, as per Dr. David Alleman, partner with Dr. Simone Deliperi of the Alleman- Deliperi Institute and creator of "6 Lessons," are as follows:

1. Conservation of more pulps
2. Repairs of fractured teeth
3. Removal of pathology
4. Saving maximum tooth structure
5. Strengthening of teeth
6. Delaying the re-treatment cycle

We often use Ribbond® fiber in our biomimetic composite restorations, a methodology supported by peer-reviewed articles. In Biomimetic Dentistry, we seek to reduce the 'C-factor' in order to increase longevity of our restorations. We do this through specific diagnostic and treatment protocols and the use of certain materials with the goal of eliminating bacterial contamination in the cavity preparation and limiting stresses within the composite.

According to Dr. Harold Heymann, professor of restorative dentistry at the University of North Carolina, C-factor is defined as the "number of bonded to unbonded surfaces in a tooth preparation." With higher C-factors, there is a greater possibility of stresses developing within the composite, which can lead to early failure of the restoration. To decrease the C-Factor, Alleman and others recommend placing the composite in increments (layering), certain delayed-curing protocols, elevating proximal boxes, and using Ribbond® fiber where needed.

In terms of the 'layering' issue, it is felt that fewer stresses develop within the composite with layering, and less polymerization shrinkage occurs with smaller incremental placement vs. bulk fill techniques. Until a consensus is reached telling us otherwise, this is considered a safer technique for the patient.

Figure 1 shows a cavity with caries detector (Danville materials) being used to properly visualize remaining caries. A Diagnodent® is also used in the process of caries detection within the cavity.

Figure 2 shows proper placement of the Ribbond® fiber, which helps reduce stresses within the composite and has been shown to increase longevity of such restorations. In certain situations, Ribbond® fiber can also be used to bridge cracks within dentin.

Furthermore, incrementally placing the composite in a specific way is another method of reducing the C-factor (see Figure 3).

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*photos courtesy of Dr. David Alleman*

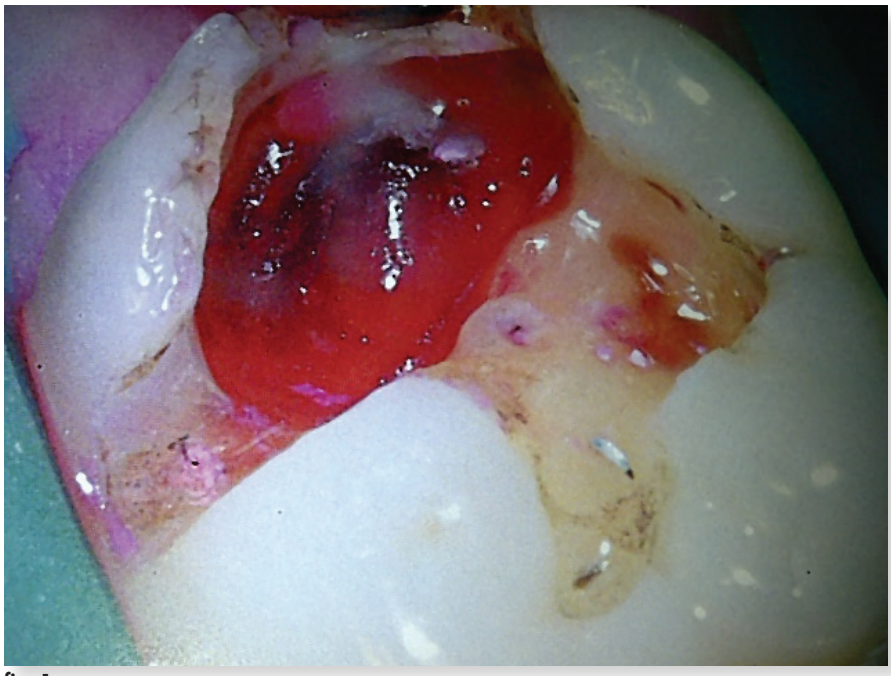

**fig. 1**

**fig. 2**

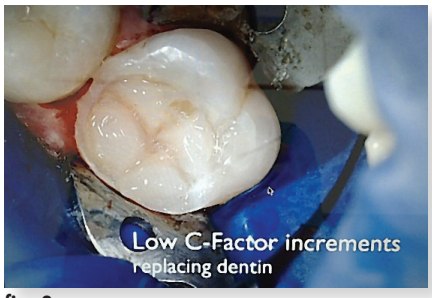


**fig. 3**

**PAGD**
1125 Windsor Road
Mechanicsburg, PA 17050

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As dentists we all know that proper treatment begins with a thorough diagnosis. In Figure 4, we see an upper first molar with a fractured and leaking amalgam restoration, with a temporary filling replacing a fractured disto-palatal cusp. We can clearly see cracks and gaps present, which lead to bacterial contamination and infection of tooth structure. Such a tooth can be successfully restored using Biomimetic tooth-conserving methods and materials rather than resorting to "tooth amputation."

In this case an onlay restoration was fabricated to replace missing tooth structure and strengthen the remaining tooth substrate (see Figure 5).

In Biomimetic Dentistry, we seek to prevent unnecessary removal of tooth structure as reported in peer reviewed literature. According to Larson, Douglas and Geistfeld (1981), Univ. of Minnesota, "The reduction of occlusal enamel is the first step toward the weakening of the crown of a tooth." (Information presented in Dr. David Alleman's "6 Lessons" course)

As vice-president and co-chair of the Academy of Biomimetic Dentistry's (ABD) annual meeting to be held in Reno, Nevada, from October 11-13, I warmly invite members of the Pennsylvania Academy of General Dentistry to learn more about these techniques. We are featuring great speakers such as Drs. Graeme Milicich, Dan Nathanson, Tim Bromege, David Alleman and others who will help us provide excellent dentistry for our patients.

For information about the ABD, please visit www.academyofbiomimeticdent.org or contact the author, Dr. Saul Pressner, at Smileinnyc@aol.com or 212-249-8999.

> "With higher C-factors, there is a greater possibility of stresses developing within the composite, which can lead to early failure of the restoration."

As dentists, we all endeavor to provide the best possible care. By mastering proper diagnostic and treatment modalities to offer our patients their best chance for preserving tooth structure, and giving them the chance to maintain their dentition in optimal health, we can enhance their prospects of overall good health. As dental professionals, we owe them nothing less. ■


**fig. 4**

**fig. 5**