INTRODUCTION
Composite resin has been widely used during most of my dental career. While the use of composite resin for Class III, IV, and V restorations was common in the late 1970s, only a few pioneers were using the material for full direct veneers. When light-cured composite resins were introduced to practicing dentists, many found that these materials answered the aesthetic desires of their patients while providing the physical properties needed for many restorations.

I began placing restorations with chemically cured composite resins very shortly after graduating from dental school, but my usage increased dramatically in the early 1980s when light-cured composites were introduced. With these new products, a dentist could adhesively bond these materials to tooth structure; build them in layers so that color could be varied and blended; cure them on command with a light-curing unit; and shape and polish them with rotary instruments.

Dentists can literally create art directly on the patient’s tooth structure. With these materials, a matrix can be used to assist the clinician in building proper anatomic form or a freehand technique can be used. The final results are in the hands of the clinician and, while some operators have more artistic ability than others, it is an art that can be learned.

Advantages of Direct Composite
Composite resin is one of the most conservative of veneering materials since only minimal preparation is needed. Adhesively bonded composite resin can be very thin since it is built directly on the tooth structure. Fees can generally be lower for direct than indirect procedures since there is no second appointment or temporary restorations required, and no laboratory expenses. When it is necessary or desirable to remove composite resin from the tooth, it can be accomplished by using a carbide-finishing bur with no damage to the underlying natural tooth structure, when used properly. When it is necessary to repair a fracture or chip, composite resin can be roughened with an air-abrasion unit (or with a diamond bur) and etched with phosphoric acid to clean the abraded surfaces. Then, a bonding adhesive can be
applied and new composite resin is added and light-cured. After the new material is finished and polished, the repair is usually imperceptible and long lasting.

**Material Considerations**
Due to their chemistry, all resin-based dental restorative products shrink during the polymerization reaction. This shrinkage results in stress on the adhesive bond and deformation of the tooth structure during polymerization. Modern nanohybrid composites have managed to reduce this effect significantly. The clinical significance of this is that it results in a better quality seal at the tooth-restorative interface, especially important at the margins.

All resin-based dental materials demonstrate water sorption in the oral cavity. There are several negative effects that are associated with the water sorption and the water solubility of the composites. Water uptake can lead to deterioration of the physical-mechanical properties of the composite (such as dimensional stability, flexural strength, elastic modulus, compressive strength, wear resistance, etc). Discoloration can result in the restoration body or margins, minimizing the aesthetics.

A natural tooth has a lifelike appearance because the color and light reflect at different depths and angles of the tooth as light penetrates the tooth. This can be called the opacity. Dentin shades have more opacity, and enamel shades have less opacity and more translucency. A surface gloss that can be maintained in the oral cavity is also an important property for aesthetics.

**CASE REPORTS**

**Case 1**

*Diagnosis and Treatment Planning*—A young woman presented with a discolored, previously placed composite filling in her left maxillary central incisor (Figure 1). She reported that the tooth had been fractured when she was a young girl and had been restored since then. A radiograph illustrated that the tooth was still vital. She wished to have it restored again, and wished for an aesthetic result. She chose a direct composite restoration for its immediate result and the more affordable cost.
Clinical Protocol—The tooth was anesthetized, and the old composite material was removed using a carbide finishing bur (H274.31.018 [Brasseler USA]) in a high-speed handpiece with constant water spray. A fine diamond bur (8850KR014 [Brasseler USA]) was used to prepare the entire facial surface for a thin composite veneer to hide the addition of the Class IV portion (Figure 2).

Figure 1. Old and discolored Class IV composite restoration on left central incisor.

Figure 2. Old composite removed and tooth prepared.

Figure 3. Etching gel applied.

Figure 4. Bonding agent applied.

Figure 5. Light-cure bonding agent.

Figure 6. A universal nanohybrid composite resin (Nanoceram-Bright [DMP Dental]) (shade B1) was used.
A celluloid matrix strip was then used to isolate the tooth. Next, the prepared tooth was etched for 10 seconds using phosphoric acid-etching gel (UniEtch [BISCO Dental Products]) (Figure 3). The gel was thoroughly rinsed off and the tooth was left slightly moist for wet bonding. A fifth-generation dentin and enamel bonding agent (All Bond III [BISCO Dental Products]) was applied liberally (Figure 4) and air-thinned using an air-water syringe before light-curing with an LED curing light (Bluephase [Ivoclar Vivadent]) for 10 seconds (Figure 5).

An increment of Nanoceram-Bright (DMP Dental), Shade B1, was applied (Figure 6) and sculpted with a composite instrument (Figure 7). The creamy characteristic of the material allowed for easy placement and shaping and did not slump from the desired form. This increment was light-cured for 20 seconds (Figure 8). Another layer of Nanoceram-Bright shade BL was added to the facial surface (Figure 9) and light-cured for 20 seconds (Figure 10).
The cured composite was then contoured with carbide finishing burs (ET6 014 and ET5 008 [Brasseler USA]) (Figure 11). The gingival margins were finished with a fine diamond bur (8392016 [Brasseler USA]) (Figure 12). A diamond-coated strip (ET9 014 [Brasseler USA]) (Figure 13) followed by aluminum oxide strips (Epitex [GC America]) were used to shape and polish the proximal areas. Lastly, aluminum oxide discs (BISCO Finishing Discs [BISCO Dental Products]) were used to polish the surfaces to a high gloss (Figure 14).

A nearly perfect color match was achieved using this nanohybrid composite (Figure 15). I noted that the hardness seemed “toothlike” and the surface gloss after 2 weeks was equal to the day of treatment.
Figure 15. Final result.

Figure 16. Maxillary first molar and second premolar with interproximal caries.

Figure 17. Antimicrobial agent (HemaSeal & Cide [Advantage Dental]) was placed in the preparations.

Figure 18. Placement of the posterior composite (Bright Posterior [DMP Dental]) composite.

Figure 19. Composite instrument was used for shaping.

Figure 20. Final posterior composite resin restorations.
Case 2

Diagnosis and Treatment Planning—A 17-year-old male patient had proximal decay at the mesial surface of his maxillary first molar and the distal surface of his second premolar tooth (Figure 16). In this case, a tooth-colored direct restoration was chosen.

Clinical Protocol—After anesthetizing the patient and applying a rubber dam (6 x 6 Non Latex Dental Dam [Hygenic]), the caries were removed and the preparations were completed. A bactericidal wetting agent (HemaSeal & Cide [Advantage Dental]) was applied to the prepared areas (Figure 17), and then a sectional matrix was placed. Next, the molar preparation was etched for 10 seconds and thoroughly rinsed. A fifth-generation dentin and enamel-bonding agent was applied liberally and air-dried with an air/water syringe. The bonding agent was cured for 10 seconds with an LED curing light.

After adding a base (liner) coat with a flowable composite (Nanoceram-Bright) (light-cured for 10 seconds), a posterior hybrid composite resin material (Bright Posterior [DMP Dental]) was added in bulk (Figure 18). The 3.4 mm depth of cure allowed for bulk filling, and the creamy consistency of the material allowed for easy contouring before light-curing for 20 seconds with an LED curing light. The matrix was removed and minor contouring was achieved using small carbide finishing burs.

A second sectional matrix was applied to restore the premolar tooth, and the same method (as described above) was used. After placing the composite resin material, it was carefully shaped with composite instruments (TNPF 18A [Hu-Friedy]) (Figure 19) before light-curing. The matrix was removed and the shape of the composite was fine-tuned with carbide finishing burs. The rubber dam was removed and slight adjustments to the occlusion were completed before the restorations were polished with composite polishing points (Enhance [DENTSPLY Caulk]).

The finished restorations demonstrated excellent anatomical form and marginal integrity (Figure 20). The color was excellent due to the chameleon-like nature of the composite resin material chosen. The patient reported no postoperative sensitivity.

DISCUSSION

I chose the Nanoceram-Bright composite system for the restorations described in this article for several reasons.

DMP Dental has been making various types of filling materials for about 25 years, and composites for 15 years. Some of their proven products are now being introduced in North America; these include Nanoceram-Bright (universal composite
resin), Nanoceram-Bright Flowable, and Bright Posterior.

Placement was made easier in the cases presented here because the Nanoceram-Bright exhibits a nice creamy consistency and was easily sculpted, with no slumping. The color matching was excellent and, after finishing, the material seemed to have a chameleon effect as it blended seamlessly into the surrounding teeth. Its low polymerization shrinkage (due to high loading and particle size blending) yields high marginal integrity, minimizes postoperative sensitivity, and greatly reduces microleakage. It is a light-cured nanohybrid composite resin composed of a special blend of nanofillers; a sophisticated method for the integration of the nanoparticles (average particle size of 20 nm) in the resin matrix worked to make it quite easy to polish, providing a natural look to the teeth with a beautiful final polish.

Bright Posterior exhibits several unique features that have been combined in one posterior composite. I especially liked the flow and creamy consistency that allowed me to bulk fill the posteriors without overfilling, thus saving time by not having to grind back the layers of heavier composites. Its flow characteristics eliminated the need for heating devices (or vibrating devices) to improve the flow of the composite, saving time and expense. I was able to carve most of the anatomy with instruments, and needed minimal chair time for the final contouring and polishing steps. Like its anterior component, the posterior material exhibits high flexural strength and modulus, 3.4 mm depth of cure, excellent compressive strength, very low water sorption/solubility, and reduced polymerization shrinkage.

IN CLOSING
In this article, I have illustrated the use of a nanohybrid composite resin system to restore anterior and posterior teeth. The material and handling properties, in addition to the beautiful aesthetics obtainable when using this class of composite resin systems, made it an excellent restorative choice for the cases presented.