Captek Product Clinical

Addressing Simple Crown and Bridge Needs with Captek, an Advanced Composite Metal

By Dr. Michael DiTolla,
Director of Clinical Education and Research,
Glidewell Laboratories

With the plethora of new materials available to today’s clinician, it is difficult to stay abreast of the latest developments and maintain a busy practice. To make matters worse, knowing what is available is only half the battle. Recognition of each individual product and system nuance is equally important to achieving the intended results. The Dentaltown.com message boards have provided a wonderful tool for clinicians to read and contribute to dialogs with other wet-gloved product users. This forum, together with many other learning opportunities, is providing a more precise roadmap so dentists can avoid the many hazards involved with making product decisions.

A restorative option that has seen a dramatic influx of so-called “esthetically advanced solutions” is the fixed partial denture. One example is the Captek bridge system. Once a clinician understands the clinical requirements of the Captek system and develops a relationship with a dedicated Captek certified laboratory, there may be little reason to continue prescribing traditional porcelain-fused-to-metal bridges. Captek shows excellent promise to make the jump from being a novel material to a standard material. Understanding the nuances of this system in addition to applying solid crown and bridge principles helps the dentist to achieve predictable, highly esthetic results.

Captek is a composite-metal technology. During the lab fabrication process for single units, the high purity gold is drawn in and through a skeleton of platinum and palladium via capillary attraction forces. This method of coping development is a significant departure from the traditional lost wax technique we learned in dental school. According to the manufacturer, the reasoning for this process is so all the elements do not alloy in a similar fashion as is the case with traditional castings. The particles of platinum/palladium and gold keep their individual properties. The platinum/palladium remains hard and rigid, while the gold provides elasticity and resiliency. This composite metal is schematically similar in structure to the reinforced resins (Fig. 1). The material, and the fabrication process, cultivates a metal ceramic coping system that provides well-documented advantages for the ceramist that can produce a significantly improved end result (Figs. 2, 3 and 4).

Continued on page 56

Fig. 1
Captek is a composite metal or reinforced gold. Notice in this cross section illustration how the platinum/palladium particles form a skeleton to support the gold.

Fig. 2
The lab applies and fires the skeleton of platinum/palladium first.

Fig. 3
97.5% gold, 2.5% silver is placed over the established skeleton of hard, stable particles and readied for high temperature firing.

Fig. 4
After the composite metal is developed, the copings are seated and a porcelain coupler is applied. The composite metal coping is ready for ceramic application.
One little known fact about Captek is the composite metal copings of gold internally reinforced with the skeleton of platinum and palladium were originally developed to be bridge abutments. According to research done at Boston University in 1995, the Captek three-unit posterior bridges tested were at least equal in load bearing capacity to any traditional metal ceramic category including non-precious.1 The balance of rigidity and resiliency from the composite metal provides enough hardness and stiffness to support porcelain veneered over the bridge framework, and yet, may absorb some of the occlusal load on the abutments.

The most common question we hear about the Captek bridge is: How do you make the pontic? Many believe the pontic is developed from the same reinforced gold as the abutments, but that is not true. The composite nature of the abutments, although nicely designed to support abutment teeth, is not designed for the physical requirements of the pontic space. Thus, the system requires the laboratory to wax and cast a noble or high noble traditional metal alloy with a palladium base. The rigidity or the high-yield strength of the traditional palladium-based alloy is needed to deflect the load onto the pontic equally to either abutment. Once the pontic is developed, the abutments are jointed to the pontic with one of three approved techniques (Fig. 5). Prior to porcelain application, the pontic, which will exhibit oxide development, is covered with a Captek material called, appropriately, Pontic Cover (Fig. 6). The finished product is a system that combines rigidity and a measured degree of resiliency. Ideally, this combination is exactly what clinicians have been searching for in materials. Many aspects of the Captek system are documented, but one personal observance is that patients seem to express a high degree of comfort with these restorations. Whether they are just lighter or they truly do absorb the shock and vibration from occlusal loading, no one knows for sure. Furthermore, it is not uncommon to hear patients verbalize that these restorations just feel comfortable. This may turn out to be a major advantage of this system over the metal-free fixed partial dentures.

Another clinical benefit of the Captek coping material is the ability to prepare the tooth in a conservative fashion. Chamfer, shoulder, knife-edged or beveled preparations can all be used with Captek, and with an overall reduction of .5 mm to 1.0 mm reduction at the margin, the coping promotes natural esthetics and eliminates over-contoured restorations. Since the Captek coping is a non-oxidizing gold, the resultant hue is a warm yellow color. Consequently, less opaque can be used, resulting in a more life-like restoration.3 The coping can even be cut short to the internal line angle of the margin, allowing the technician to build a true porcelain margin, for the ultimate in esthetics.

---

**Clinical Case Review**

The patient presented with existing bridgework done years before. The chief complaint of the patient was the obvious artificial look of the restoration along with the dark spaces and darkening soft tissue. Notice other issues certainly exist, but due to financial reasons the patient was allotting funds to fix what he interpreted as the major aesthetic issue. After removing the bridge, the pontic site was re-contoured; the margin placement was established at a place that would allow for better profiles, papilla formation, tissue health and marginal esthetics. At this time the clinical condition was evaluated to determine if a Captek bridge was an option. The clinical conditions necessary are as follows: axial wall height of 3 mm for anterior teeth and 4 mm for molars with an axial taper of no more than 25 degrees. Occlusal clearance must be at least 1.5 mm for lingual porcelain coverage and maximum porcelain strength. The company recommends pontics be limited to no more than two consecutive pontics anywhere in the mouth except if a patient is missing four mandibular incisors. Therefore, a six-unit lower anterior bridge, cuspid to cuspid can be done with Captek. Because the outlined clinical conditions existed, Captek was prescribed. After preparation and impression, a prefabricated BioTemp bridge (Glidewell Laboratories) was cemented.

In the laboratory fabrication stage, care was given to developing connectors in the appropriate spaces as dictated by a model of the temporaries. Additionally, the detailed porcelain fabrication was completed per the information provided (i.e., photos, study models, and a detailed prescription). The final result accomplished all the treatment goals set forth for the patient (Figs. 7, 8 and 9).

Clinically, this internal and external gold surface is of tremendous benefit. Internally, the gold surface contacts the preparation and due to its high nobility, helps eliminate any potential for allergic or adverse reactions. Dr. Gordon Christensen recently remarked...
at one of his CRA Update courses that nearly 50% of all women will have some sort of allergic or adverse reaction to non-precious metals, and that it can take upwards of 7 to 10 years to develop. The implications of his statement are clear. Why use non-precious metals if a high-noble substitute with equal strength and superior esthetics is available?

The choice of non-precious metals usually boils down to cost in my experience. I believe patients are willing to pay for upgraded materials if the advantages are explained to them and the cost is fair. For years, in my lectures, I have advised dentists to multiply their laboratory fee for a crown by a factor of six or more to assure profitability for a procedure. Remember, one-third of every general dental office’s production and collections come from fixed prosthodontics, so it is imperative you charge a fair fee for these services.

Let’s assume the difference in lab cost between a non-precious ceramometal crown and a Captek crown is $25. According to the 6X multiplier, you would need to raise your crown fee $150 to stay within this guideline. However, unlike an all-ceramic restoration, the Captek crown doesn’t require any additional dentist or office time at the preparation or seating appointments. The only difference, and the reason for the $25 increase, is the cost of the high-noble gold coping. In a case like this, it is perfectly acceptable to just add the $25 fee to your normal crown fee, since there is no other difference between this crown and a typical non-precious ceramometal crown. In fact, the Captek crown may even take less time due to the fact it meets with such high patient acceptance when used on anterior teeth, or posterior teeth for that matter.

Restorative dentists are often faced with the task of determining which restoration will best suit our patient in a particular case. At times esthetics is the over-riding concern, while in some cases strength is the most important consideration. When we are unable to achieve a dry field, we often find ourselves in need of a restoration that can be conventionally cemented rather than bonded into place. Perhaps the subgingival location of a crown margin, or the unhealthy appearance of the gingiva would dictate choosing a material like Captek that demonstrates the lowest bacterial accumulation rates of any available material. More often than not, our aim is to maximize all of these qualities, which is why Captek remains my most prescribed product for single crowns and bridges. What started out as my “esthetic” PFM has become my “everyday” PFM crown or bridge, and indeed there are hardly any situations where Captek is not my restoration of choice.

Dr. DiTolla graduated from the University of the Pacific School of Dentistry with honors in 1988. Dr. DiTolla was awarded his Fellowship in the Academy of General Dentistry in 1991 at the age of 27 making him the youngest recipient of this award.

Dr. DiTolla is a graduate of the Las Vegas Institute of Cosmetic Dentistry and the PAClive program, and an instructor for the Hornbrook Group, a hands-on live patient course emphasizing veneer preparation and placement.

Dr. DiTolla can be contacted by e-mailing mcditto@mac.com.

Bibliography