

# New Advances in Temporization Materials: The Protemp Crown

**Greggory A. Kinzer, DDS, MSD**  
Affiliate Assistant Professor  
University of Washington  
School of Dentistry  
Seattle, Washington

Private Practice  
Seattle, Washington

Provisional restorations play an essential role when performing indirect restorative procedures. An accurate-fitting temporary seals the margins of the preparation, thereby reducing microleakage and sensitivity. It also helps to support the contours of the surrounding gingival tissues, ensuring that they can be easily cleaned and remain healthy. Occlusally, the provisional restoration helps to maintain the position of the prepared tooth and adjacent teeth by providing stable interproximal and occlusal contacts. All of these factors combined will significantly impact the seating of the definitive restoration by maintaining gingival health and tooth position.

Three main factors are involved in fabricating provisional restorations

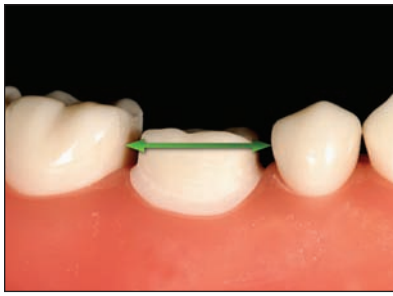
that achieve all of the aforementioned goals. These factors are the type of provisional material, the fabrication technique, and the amount of time spent fabricating the provisional restoration. Currently, there are more provisional restorative materials on the market than ever before. The two main categories of materials are the powder/liquid acrylics (methyl-methacrylates, ethyl-methacrylates) and the composite-based resins (Bis-acryl composites, light-cured composites). Although the chemical make-up and handling characteristics of these materials may be different, all of these provisional materials can be used successfully. So, if all of the materials can be used clinically to accomplish the goals of provisionalization, what is the limiting factor? The amount of time spent in fabrication of the provisionals and/or the technique. Typically, the amount of time spent fabricating the provisional is directly proportional to the amount of time remaining in the appointment before the next patient. With this in mind, the ideal provisional material and technique for single units would be one that is both time-efficient and user-friendly. The Protemp™ Crown (3M ESPE, St. Paul, MN) can be used to accomplish both (Figure 1).



**Figure 1** The Protemp Crown combines the advantages of a composite-based resin temporization material (customized fit, esthetics) with the advantages of a prefabricated crown (no matrix required, efficient).



**Figure 2A and Figure 2B** In its uncured state, Protemp Crown is malleable and handles like clay, allowing it to be easily molded, shaped, and adapted to allow a customized fit.



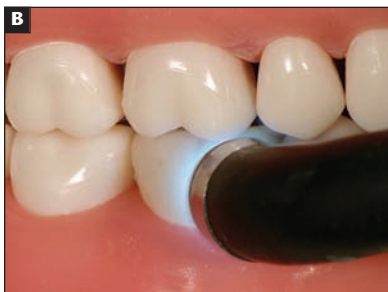
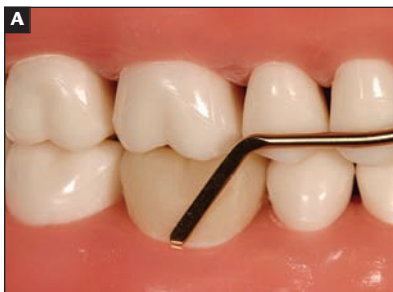
**Figure 3** To obtain the appropriate Protemp Crown size, measure the mesial-distal dimension of the space of the prepared tooth (proximal contact → proximal contact). The dimension can then be related to the sizing chart to help identify the correct crown.



**Figure 4** Measuring the height of the adjacent clinical crowns serves as a guide to determine the amount of excess to be trimmed off the gingival cuff. Crown-and-bridge scissors can be used to trim the crown. Make sure to follow the contours of the patient's gingival architecture from the buccal to the interproximal.



**Figure 5A and Figure 5B** Once properly trimmed, the Protemp Crown can be seated over the preparation with light finger pressure. Gently rolling the crown between the fingers will help warm the material and make it more malleable. With the crown seated on the preparation, adapt the buccal and lingual contours with the fingers to begin establishing the contour of the axial surfaces and to help establish the interproximal contacts.



**Figure 6A and Figure 6B** With the patient closed in maximum intercuspation, adapt the provisional to the buccal margin using a plastic instrument or finger followed by tack-curing the buccal surface for 2 to 3 seconds. Care should be taken to not over-cure the material.



**Figure 7A through Figure 7C** With the patient open, adapt the lingual margin with a plastic instrument or finger while maintaining finger pressure on the buccal surface to help prevent movement or dislodgment of the crown. Once completed, tack-cure the lingual surface for 2 to 3 seconds followed by the occlusal surface for 2 to 3 seconds, taking care to avoid over-curing the material.

## PROTEMP CROWN TEMPORIZATION MATERIAL

The Protemp Crown combines the advantages of a composite-based resin temporization material (customized fit, esthetics) with the advantages of a pre-fabricated crown (no matrix required, efficient). What is unique about the Protemp Crown is that the material itself is malleable and hence does not need to be relined with any other material. In its uncured state the Protemp Crown handles like clay, which allows the crown to be easily customized and adapted (Figure 2A and Figure 2B). The malleable nature of the material not only provides an intimate fit to the prepared tooth structure and margins, but also accurately captures the proximal and occlusal contact by having the patient bite together. Once the contours have been established, the restoration can be tack-cured to reduce the possibility of distortion upon removal. After the provisional is removed from the mouth, it can be fully light-cured before finishing and polishing. Currently, Protemp™ Crown Temporization Material (3M ESPE) is available for maxillary and mandibular molars, premolars, and canines in one universal shade. The physical properties of Protemp Crown Temporization Material show both a high flexural strength and fracture toughness with a wear rate that is similar to direct composite. The material is also radiopaque.

## TECHNIQUE

Upon completion of the preparation, the first step is to determine the proper Protemp Crown size. Given their



**Figure 8A through Figure 8C** Care must be taken when removing the tack-cured crown because it is only semi-cured and has the potential for distortion. Upon removal, light-cure the provisional for an additional 60 seconds outside the mouth; make sure that all of the surfaces are exposed to the light. Note how well the Protemp Crown adapts to the prepared tooth and the minimal amount of trimming and finishing that needs to be completed.



**Figure 9A and Figure 9B** The completed Protemp Crown shows a natural form and contour that blends well with the surrounding dentition.

malleability, Protemp Crowns come in only two sizes (small and large), with the main difference being the mesial-distal width. To obtain the appropriate size, the mesial-distal width of the space needs to be measured (proximal contact → proximal contact) (Figure 3). The provisional kit comes with a crown-size tool to help measure the mesial-distal width; however, the space can just as easily be measured with a periodontal probe or calipers. To better customize the crown before trying it in, the crown height of the adjacent teeth also needs to be measured. Once the appropriate crown size is chosen (according the mesial-distal width), the crown height measurement is used as a guide to determine the amount of excess to be trimmed off the gingival cuff (Figure 4).

With the excess trimmed from the gingival margin, the crown can be seated over the preparation to begin the adaptation process (Figure 5A). It is advisable to apply a light coat of petroleum jelly to the preparation to help

prevent the crown from adhering and to make the removal process easier. Once the crown is in the mouth, adapt the buccal and lingual contours with your fingers to begin establishing the contour of the axial surfaces and to help establish the interproximal contacts (Figure 5B). Next, have the patient close into maximum intercuspation to help establish the occlusion. While the patient is still closed, adapt the provisional to the buccal margin using a plastic instrument or finger (Figure 6A). The plastic instrument can also be reoriented and used to start contouring the interproximal areas.

With the patient in maximum intercuspation and the buccal margin adapted, tack-cure the buccal surface for 2 to 3 seconds (Figure 6B). Care should be taken not to over-cure the material as this may cause the provisional to lock onto the preparation. The next area to be adapted is the lingual margin. With the patient open, adapt the lingual margin with a plastic instrument

or finger while maintaining finger pressure on the buccal surface to help prevent movement or dislodgment of the crown (Figure 7A). Once completed, tack-cure the lingual surface for 2 to 3 seconds and then the occlusal surface for 2 to 3 seconds (Figure 7B and Figure 7C). After the tack-cure, carefully remove the provisional crown and light-cure for an additional 60 seconds outside the mouth, making sure to expose all of the surfaces to the light (Figure 8A through Figure 8C). Conventional finishing of the provisional crown can be accomplished with carbide burs, rubber wheels, and/or finishing discs. The final polish is completed in two steps. The first uses a wet rag wheel and pumice followed by a high shine using a dry rag wheel and polishing paste. Once the polishing is completed, the restoration can be tried in the mouth to verify the fit and occlusion, and conventionally cemented with temporary cement (Figure 9A and Figure 9B).

## CONCLUSION

The Protemp Crown is a preformed, light-cured, tooth-colored composite crown designed for full-coverage provisional restoration of molars, premolars, and canines. The uniqueness of the material can be attributed to the fact that it is malleable and does not need to be relined with any other material. The Protemp Crown creates single-unit provisional restorations that are not only customized and esthetic, but also easily fabricated in minimal time.

*An accurate-fitting temporary seals the margins of the preparation, thereby reducing microleakage and sensitivity.*