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# SIMPLIFIED SINGLE CROWN PROVISIONAL RESTORATIONS

Howard E. Strassler, D.M.D., F.A.D.M., F.A.G.D.  
 Professor and Director of Operative Dentistry  
 Department of Endodontics, Prosthodontics and Operative Dentistry  
 University of Maryland Dental School

with J. Richard Bradbury, D.D.S., Associate Professor  
 Department of Endodontics, Prosthodontics, and Operative Dentistry  
 University of Maryland Dental School

2 CONTINUING EDUCATION CREDITS

## COURSE OBJECTIVES

Upon completion of this course, the participant will be able to:

- List the functions of provisional restorations in fixed prosthodontics.
- List materials that can be used for single crown provisional restorations in fixed prosthodontics.
- Describe the indications for the use of pre-formed single crown provisional restorations.
- Describe the technique for fabrication of a single crown provisional using a pre-formed composite resin crown form.

## COURSE SPONSOR

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Upon completion of the course, each participant scoring 80% or better (correctly answering 16 of the 20 questions) will receive a certificate of completion verifying two Continuing Dental Education Units. The formal continuing education program of this sponsor is accepted by the AGD for FAGD/MAGD credit. Term of acceptance: November 2009 through December 2013. Continuing education credits issued for participation in this CE activity may not apply toward license renewal in all states. It is the responsibility of participants to verify the requirements of their licensing boards.

## COURSE FEE/REFUNDS

The fee for this course is \$54.00. If you are not com-

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Your feedback is important to us. Please complete the brief Course Evaluation survey at the end of your booklet. Your response will help us to better understand your needs so we can tailor future courses accordingly.

## WHY TAKE THIS COURSE?

**PATIENT CARE**—Offer your patients the most in-demand treatment methods while enhancing your practice's profitability.

**CONVENIENCE**—Review the latest information on single crown provisionals and related materials in a concise and consolidated format.

**CE CREDITS**—Successful completion of this course earns you 2 Continuing Dental Education Units.

**HIGH VALUE**—Continue your education without traveling, taking time away from work and family, or paying high tuition, registration and materials costs.

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## WHO SHOULD TAKE THIS COURSE?

Dentists, Dental Assistants and Dental Hygienists.

Temporary or provisional single crown restorations shield the underlying tooth preparation and pulp while the definitive restoration is being fabricated by the laboratory. This is pulpal protection promotes pulpal healing after the trauma of tooth preparation. Also, a well-adapted and contoured provisional crown assures the return to health of any soft tissues traumatized during the crown preparation and impression-making process by allowing the patient to maintain their oral hygiene adjacent to the temporary crown with brushing and flossing.

visional crowns provide important diagnostic information that help determine the desired occlusal relationships and, in cases where the crowns are being used to alter the occlusal vertical dimension, these provisional restorations are a guide to the desired occlusal position.

Other important purposes for the provisional restoration include the maintenance of the tooth preparation position both occlusally and proximally.<sup>(1-4)</sup> The provisional restoration should be adjusted to duplicate the desired final occlusion and must have proximal contact with adjacent teeth to avoid tooth movement and shifting that can have a negative impact on the placement of the final restoration. If the tooth or teeth that have been prepared shift after the impression is made, the restoration returned by the laboratory will very likely need more proximal contact and occlusal adjustment before cementation. In some cases, the movement of the tooth preparation can change the path of insertion for the final crown or fixed partial dentures and may not allow complete seating of the restoration during try-in. For a multiple unit, fixed partial denture with a metal framework, that restoration may need to be sectioned for soldering and if the fixed partial denture is all-ceramic, it may require a new impression and re-fabrication of the restoration.

Any changes in tooth position can lead to an increase in chair time required during the try-in and cementation appointment. In extreme cases when teeth have moved due to loss or fracture of the provisional restoration, the practitioner might have to fabricate acrylic resin copings and make a pick-up impression so that the laboratory has the new tooth preparation positions when prefabricating the final restoration. In some cases due to tooth movement, the tooth preparation might need to be orthodontically repositioned or the teeth re-prepared. This leads to a significant increase in chair time and may lead to patient dissatisfaction due to the additional procedures and office visits. For the tooth that has shifted only a minor amount, the consequences may only be an increase in chair time during the cementation appointment.

As a clinician, the fabrication of temporary res-

From a clinician's standpoint, temporary crowns provide critical information by helping the clinician decide if there is adequate occlusal clearance and reduction of the tooth preparation for the final restoration. In the case of anterior esthetic restorations, the provisional crowns can provide the clinician with guidance as an esthetic trial to the color, contours, length, widths, and shapes of the teeth before fabrication of the final porcelain-metal or all-porcelain restoration. If more than one tooth is being restored, pro-

**TABLE 1:**  
Partial listing of resin based provisional materials

NAME	MANUFACTURER
<b>ACRYLIC RESIN</b>	
Alike	GC America
Jet Tooth Shade	Lang Dental
Snap	Parkell
Unifast LC	GC America
<b>BIS-ACRYL COMPOSITE</b>	
Gorgeous Temp	Den-Mat
LuxaTemp	Zenith Dental
LuxaTemp Fluorescence	Zenith Dental
LuxaTemp Solar Plus	Zenith Dental
Protemp 3 Garant	3M-ESPE
Integrity	Dentsply Caulk
Fill-In	Kerr Dental
Tempphase	Kerr Dental
Access Crown	Centrix Dental
Smart Temp	Parkell
Cool Temp Natural	Coltene-Whaledent
TempSpan	Pentron Clinical
Systemp C&B	Ivoclar

CUT ALONG DOTTED LINE

restorations for a single crown requires proficiency with a variety of materials and techniques that can be used to make well-adapted and functional provisionals. There are many options to choose from for temporizing a single crown including: prefabricated polycarbonate crowns, composite resin crowns, stainless steel crowns, aluminum shell crowns, clear plastic colloid crown formers, acrylic resin for custom provisionals, bis-acryl automix composite resin materials and composite resin for custom fabrication.<sup>(2-4)</sup>

In many cases of single tooth preparation, the tooth being prepared is fractured, misaligned, or poorly contoured. In other cases, the patient presents for an emergency appointment with a tooth in need of a full-coverage restoration. There is no time to fabricate a custom crown shell and making a template of the existing tooth is out of the question due to its poor condition. In these circumstances, the best choice is a prefabricated provisional crown form. For single tooth crown preparations, the practitioner can use prefabricated polycarbonate crown shells that require relining with an acrylic resin for anterior teeth and premolars. A preformed metal crown fabricated from stainless steel or aluminum can be used in some cases. In this instance, to make the provisional restoration well adapted to the tooth preparation margins, a dental resin would be placed to reline the prefabricated provisional.

Recently, a novel prefabricated crown form made of light-cured composite resin was introduced. Protemp Crown (3M ESPE) offers the benefits of any prefabricated crown form for ease of use, combined with the esthetics and excellent mechanical properties of fracture and wear resistance.

Another choice for the single crown is the use of a template that can be filled with a provisional resin to fabricate the temporary crown. Dental resins for temporary crown fabrication include acrylic resin or Bis-acryl composite resin materials. Table 1 contains a partial listing of provisional resin materials.

Typically when fabricating a temporary restoration with a dental resin, you must make one of two things: (a) a custom shell that will be relined

with acrylic resin at the time of tooth preparation to mimic the natural contours and anatomy or (b) a carrier, or template, for the provisional restorative material that is fabricated prior to the tooth preparation appointment. The dental literature describes the use of warmed wax, pre-made acrylic shells, vacuum formed polypropylene matrices, and vinyl polysiloxane impressions.<sup>(2-7)</sup>

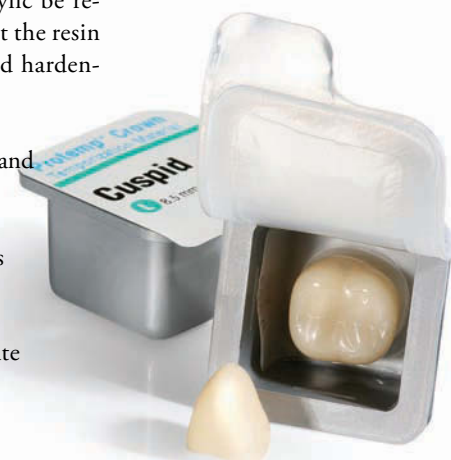
In the past, the choice of tooth colored provisional resins was limited to acrylic resins. With traditional acrylic resins, the fabrication of the provisional restoration usually requires mixing a powder and liquid together to form a paste that is placed in either a pre-made shell, template or carrier that is placed over the tooth preparation. Timing and monomer/powder ratio is critical to determining the setting time. It is usually difficult to time the setting and working stages of the polymerization reaction of acrylics. An inconsistent monomer-powder mix leads to difficulty in timing the removal of the template from the tooth. Leaving the template in place with the acrylic resin can lead to pulpal irritation or gingival trauma due to the heat of the setting reaction. Also, if the acrylic resin sets too fast, the temporary can become locked onto the tooth preparation due to the high degree of shrinkage of the resin. Perfect timing for acrylic resin requires that when the acrylic resin reaches a rubbery consistency, the carrier and acrylic be removed from the tooth preparation so that the resin can achieve complete polymerization and hardening out of the mouth.

Although these materials are tooth colored and relatively inexpensive, they are difficult to manipulate and have poor physical properties.<sup>(8)</sup> Powder-liquid acrylic resins are typically polymethylmethacrylates (PMMA). These materials are sloppy to use, shrink on polymerization, generate



Fig. 1 A Protemp Crown kit

Fig. 1 B Examples of Protemp Crown in light-safe packaging



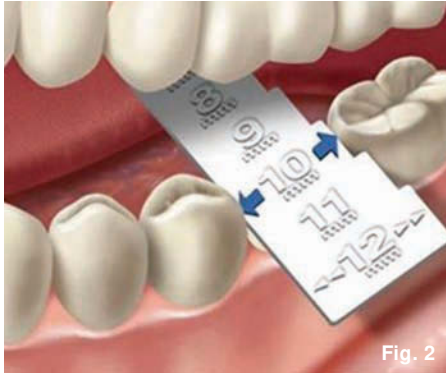


Fig. 2



Fig. 3

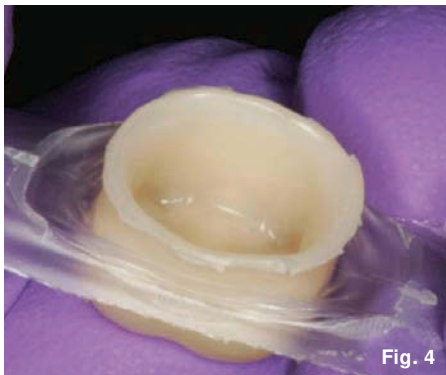


Fig. 4

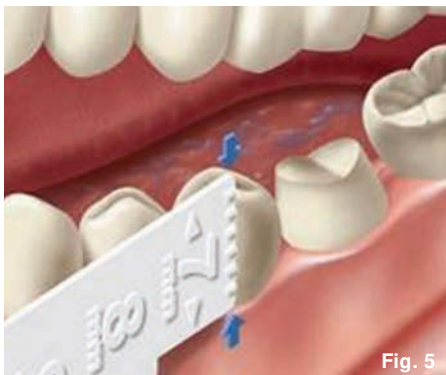


Fig. 5

**Fig. 2** Protemp width measure gauge to determine mesial-distal width to select correct size of crown.

**Fig. 3** Mandibular molar Protemp Crown selected.

**Fig. 4** Removal of plastic covering from Protemp Crown.

**Fig. 5** Measuring the occlusal gingival height of the crown to determine the trimming of the crown.

significant heat during polymerization and

have an unpleasant odor while setting.

(3, 8, 9) Also, these resins show significant wear in occlusal function, are susceptible to breakage, have poor fit and can discolor over time.<sup>(10, 11)</sup> When a bis-acryl composite resin provisional material was compared to PMMA, one study concluded that the bis-acryl composite resin was significantly superior to PMMA as a provisional restorative material.<sup>(11)</sup>

One concern with resin based restorative materials is environmental damage due to dietary solvents. Bis-acryl composites were more resistant to the problems of wear and color changes than other provisional materials.<sup>(12, 13)</sup> One method described in the literature for fixed partial dentures that increases the flexural strength and resistance to breakage of acrylic resins is the use of fiber reinforcement embedded in the provisional material.<sup>(14, 15)</sup>

To overcome the deficiencies of acrylic resin, new custom temporary materials — bis-acryls with improved physical properties — have been introduced to simplify the fabrication of provisional restorations.<sup>(1, 5, 6, 8-10, 16)</sup> Bis-acryl composite resins are typically dispensed in a double-barrel tube configuration where the catalyst and base pastes are mixed in automixing tips. Bis-acryl typically have significantly less shrinkage than acrylic resin due to the presence of radiopaque glass fillers which improves the fit of the provisional restoration to the tooth preparation.<sup>(8,11)</sup> These glass fillers also improve the wear characteristics of the material.

Bis-acryls have a paste-paste formulation which undergoes a three-stage polymerization reaction. The first phase goes from a free-flowing paste that adapts to the tooth preparation

and then becomes elastic within 60-75 seconds. The second phase over the next four minutes is a cross-linking polymerization reaction allowing the polymer to reach a high compressive strength. The final phase of polymerization allows the resin to reach its final hardness within five minutes after initial mixing so that the restoration can be adjusted and polished before cementation.

For single crowns, there has been an increasing trend toward the use of bis-acryl composite resin provisional materials due to their better physical properties and ease of use. With the introduction of Protemp Crown, a pre-formed crown made from composite resin takes advantage of the benefits of bis-acryl composite resin provisional materials with the additional benefit of being in a preformed shell. It has been reported that provisional composites used for provisional restorations have advantages over other resin based provisional materials.<sup>(1, 5, 6, 8, 10-19)</sup>

### Protemp Crown Temporization Material

Protemp Crown temporization material is a light-cured composite resin, preformed crown for single-unit temporization of mandibular premolars and molars, maxillary premolars and molars and canines (Fig. 1). It combines the advantages of composite-based temporization materials (fit, wear resistance and esthetics) with the advantages of prefabricated crowns (fit, ease of use, no need for additional matrix, and easy clean-up). It is a preformed, moldable composite-based crown that can offer custom fit and adaptation in less than four minutes.

This novel temporization material is easily moldable. In its uncured condition, it handles like putty that can be easily molded and reshaped using your traditional composite instruments. Its moldable state offers the ease of adaptation to the buccal, lingual and interproximal margins with the additional advantage of attaining proximal and occlusal contacts before light curing. The chemistry of this composite combines a light cured (on-demand setting) resin matrix filled with chemically interacting, aggregated organic fillers.

Protemp Crown bis-GMA resin chemistry

provides an improvement in physical properties.

<sup>(19)</sup> Polymerization shrinkage is one of the most negative aspects of acrylic resins. Acrylic resins have almost a 5% shrinkage upon setting. This shrinkage leads to temporaries that don't fit when tried back onto the tooth preparation. Protemp Crown's performance is similar to the polymerization shrinkage of a typical restorative composite, approximately 1.7% volumetric shrinkage. It has more than twice the compressive strength of a polymethylmethacrylate acrylic resin, almost 2.5 times greater diametral tensile strength and more than twice the flexural strength. These improved physical properties translate into a more

crown (Fig.5). Using a crown and collar scissors, trim the Protemp Crown to the height that has been determined following the gingival contours of the tooth (Fig. 6).

With the crown form cut to height and contour, it was tried on the moist tooth preparation. (During this time, turn the chairside operatory light to a lower setting or so that it is not in direct illumination of the tooth preparation to avoid the possibility of initial light curing of the Protemp Crown.) Because the width was pre-selected, the proximal contact should be correct. Use your gloved fingers to gently compress the crown on the buccal and lingual surfaces for initial adaptation of the crown



Fig. 6



Fig. 7

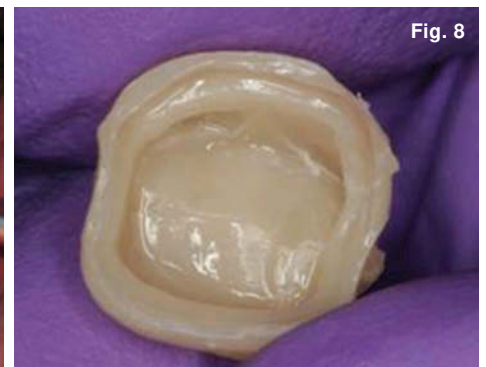


Fig. 8

durable single tooth provisional restoration. In function, the composite structure of Protemp Crown has been shown to be similar in wear resistance to typical restorative composites and more than twice the wear resistance of bis-acryl provisional composites. Protemp Crown also is radiopaque.

#### Technique with Protemp Crown

After the crown preparation, use the single-use crown size selection gauge to measure the mesial-distal width between the adjacent teeth (Fig. 2).

The Protemp Crown chart provides the width measurements for the preformed crowns that are available. For this case, the Protemp lower molar "S" crown was selected (Fig. 3). Each Protemp Crown has unit packaging in its own light-safe package. After the pre-formed crown was selected it was removed from the package and stored in a light-safe container for protection. After removal from the container, the plastic film is removed from the crown form (Fig. 4). Using the same single-use gauge, determine the occlusal gingival height of the

form. Using a composite instrument, the crown was closely adapted to the buccal surface (Fig. 7). Using a plastic lingual instrument and burnisher, push the composite resin crown form to have the mesial and distal marginal ridges the same height as the adjacent teeth. With the plastic lingual instrument holding the buccal contour, the patient was instructed to bite down to establish the occlusion on the crown form. The buccal surface was then tack cured for 2-3 seconds with the patient biting down.

With the proximal contacts established, the buccal surface contoured and adapted and the occlusion established, the lingual surface was adapted. When adapting the lingual surface with the plastic lingual instrument, use your gloved finger to stabilize the buccal surface to ensure the adaptation of the buccal surface. Once the lingual surface has been adapted with the plastic lingual instrument, tack cure the lingual surface with your curing light for 2-3 seconds. With the buccal and lingual surfaces tack cured, the occlusal surface can be

**Fig. 6** Following the gingival contours, use a crown and collar scissors to trim the height of the crown.

**Fig. 7** Adapting the buccal margin of the crown.

**Fig. 8** The crown after light curing; the margins are easily readable for trimming.



Fig. 9



Fig. 10

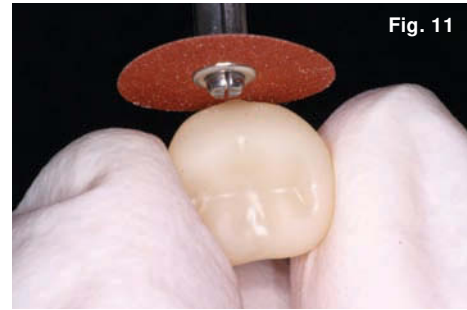


Fig. 11



Fig. 12



Fig. 13A



Fig. 13B

**Fig. 9** Trimming the gingival margins with an acrylic bur (SS White Burs). **Fig. 10** Fine trimming and refinement of the margins with a coarse XT Soflex disk. (3M-ESPE) **Fig. 11** Protemp Crown after polishing with Jazz composite polisher (SS White Burs). **Fig. 12** Schematic demonstrating temporary cement removal. Note the knot in the dental floss to pull out excess cement from the interproximal areas. **Fig. 13** Cemented Protemp crown provisional restoration demonstrating physiologic contours, esthetics, and function. Dentistry by Scott Arne, DDS **A** Buccal view **B** Occlusal view

cured for 2-3 seconds.

With the shape of the crown preliminarily hardened (tack cured), the crown form was removed and the crown was additionally light cured on the buccal, lingual and occlusal surfaces for 40-60 seconds (dependent on the power density and type of the curing light used). Protemp Crown requires complete polymerization before any further adjustment. After complete polymerization, the margins of the crown form are easily visualized (Fig. 8).

The crown margins were trimmed with an acrylic bur (SS White) (Fig. 9) and a coarse XT disk (3M ESPE) on a pop-on mandrel (Fig. 10). The crown was tried in and the occlusion was adjusted. A final polish of the Protemp crown was accomplished with a one-step diamond impregnated composite resin rubber abrasive (Jazz polisher, SS White) (Fig. 11).

The crown was cemented with a non-eugenol provisional cement (RelyX Temporary NE 3M ESPE). Sometimes, for teeth with large gingival embrasures, the cement is more difficult to remove from the embrasure spaces. For these cases, tying two to three knots into an end of dental floss will allow the larger knotted

area to pull out the gross set cement. The set temporary cement was removed using an explorer and interproximally using a piece of dental floss that was knotted and pulled through the contact area (Fig. 12). The completed ProTemp crown provides for positional stability of the tooth preparation, contour and gingival adaptation consistent with gingival health, esthetics, and wear resistance in function (Fig. 13).

**Conclusion**

This article described a technique for simplified, predictable, esthetic single crown provisional restorations with a novel, light cured composite resin preformed crown. Protemp Crown offers an alternative to other esthetic provisional materials in an easy-to-use, preformed product with excellent mechanical properties.

Employing the techniques described, a clinician can reduce chair time by almost 30 minutes compared to when using a self-cure acrylic resin for temporary crowns and bridges. The techniques described will allow the clinician to fabricate high quality, well adapted provisional restorations that are wear resistant and more esthetic than conventional acrylic resins.

**REFERENCES**

1. Strassler HE. Provisional crown and bridge resin materials: an update. *Maryland State Dental Association Journal*. 1998 41(1):11-12.
2. Gratton DG, Aquilino SA. Interim restorations. *Dent Clin North Am*. 2004 48(2):487-97.
3. Gegauff AG, Holloway JA. Interim fixed restorations. In *Contemporary Fixed Prosthodontics*. Editors. Rosenstiel SF, Land MF, Fujimoto J. 4th Edition. Mosby Elsevier, 2006. pp. 466-504.
4. Zinner ID, Trachtenberg DI, Miller RD. Provisional restorations in fixed partial prosthodontics. *Dent Clin North Am*. 1989 33(3):355-77
5. CRA Newsletter. Bis-acryl provisional materials. 21(2):3, 1997.
6. Adept Report. Provisional materials. 5(3):1-16, 1997.
7. Martinez-Rodriguez T. Procedure for reconstruction with autopolymerizing resins in the mouth. *Dent Abstr* 1:82-83, 1956.
8. Powers JM. Composite restorative materials. From *Restorative Dental Materials 12th edition*, editors: Powers JM, Sakaguchi 2006 publisher Mosby-Elsevier pp. 189-212..
9. Driscoll CF, Woolsey G, Ferguson WM. Comparison of exothermic release during polymerization of four materials used to fabricate interim restorations. *J Prosthet Dent*. 1991 65:504-6.
10. Sham AS, Chu FC, Chai J, Chow TW. Color stability of provisional prosthodontic materials. *J Prosthet Dent*. 2004 91:447-52.
11. Young HM, Smith CT, Morton D. Comparative in vitro evaluation of two provisional materials. *J Prosthet Dent*. 2001 85:129-32.
12. Yap AU, Mah MK, Lye CP, Loh PL. Influence of dietary simulating solvents on the hardness of provisional restorative materials. *Dent Mater* 2004; 20:370-6.
13. Akova T, Ozkomur A, Uysal H. Effect of food stimulating liquids on the mechanical properties of provisional restorative materials. *Dent Mater*. 2006; 12:1130-4.
14. Saygili G, Sahmali SM, Demirel F. The effect of glass fibers and aramid fibers on the fracture resistance of provisional restorative materials. *Oper Dent*. 2003 28:80-5.
15. Hamza TA, Rosenstiel SF, Elhosary MM, Ibraheem RM. The effect of fiber reinforcement on the fracture toughness and flexural strength of provisional restorative resins. *J Prosthet Dent*. 2004 91:258-64.
16. Yilmaz A, Baydas S. Fracture resistance of various temporary crown materials. *J Contemp Dent Pract*. 2007 8:44-51.
17. Bohnenkamp DM, Garcia LT. Repair of bis-acryl provisional restorations using flowable composite resin. *J Prosthet Dent*. 2004 92:500-2.
18. Hagge MS, Lindemuth JS, Jones AG. Shear bond strength of bis-acryl composite provisional material repaired with flowable composite. *J Esthet Restor Dent*. 2002; 14:47-52
19. Jones T, Karim N, Winters E, Jacobs D, Rusin R. A new temporary preformed curable crown material: mechanical properties. *J Dent R (Special Issue A)*. 2007 87: abstract no. 130.

1. **According to this article, the fabrication of a well-made, fitting and adjusted provisional (temp) crown is important because:**
  - a. the final restoration requires only minimal proximal contact and occlusal adjustment.
  - b. there is an increase in sensitivity but it will decrease over time.
  - c. clean-up of the final cement is more effective.
  - d. there is better numbing with local anesthetic.
2. **An important function of a provisional restoration is to provide pulpal protection to the tooth that was prepared. This pulpal protection:**
  - a. is dependent on the marginal seal of the restoration.
  - b. does not matter in the long run because most crowns need endodontic treatment.
  - c. promotes pulpal healing after the trauma of tooth preparation.
  - d. requires the use of a calcium hydroxide for temporary cementation.
3. **TRUE or FALSE: During tooth crown preparation, the gingival tissues can sometimes be traumatized. In order to insure gingival tissue healing, the provisional restoration should always be fabricated to be short of the margins of the tooth preparation.**
  - a. Both statements are true.
  - b. The first statement is true, the second statement is false
  - c. The first statement is false, the second statement is true.
  - d. Both statements are false.
4. **Provisional restorations hold the position of prepared tooth occlusally and proximally. This means:**
  - a. The provisional restoration margins retract the gingival tissues for easier impression making of the preparation margins.
  - b. The provisional restoration provides for maintenance of gingival tissues while cemented.
  - c. The provisional restoration allows space for temporary cement to seal the margins.
  - d. The provisional restoration stabilizes the tooth position so there is no movement after impression making, resulting in a more accurate fit and less adjustment of the final restoration.
5. **Temporary crowns for anterior teeth can provide the practitioner with guidance for:**
  - a. length of tooth (teeth).
  - b. width of tooth (teeth).
  - c. shape of tooth (teeth).
  - d. contours of tooth (teeth).
  - e. All the above.
6. **TRUE or FALSE: Temporary crowns should never be used to alter the occlusal vertical dimension and evaluate occlusal change. Dental resins used for temporary crowns wear too quickly in function to be used to evaluate occlusal changes.**
  - a. Both statements are true.
  - b. The first statement is true, the second statement is false.
  - c. The first statement is false, the second statement is true.
  - d. Both statements are false.
7. **The reason why a provisional restoration should be adjusted to duplicate the desired final occlusion and proximal contact is because:**
  - a. the patient will like the appearance of the provisional better and will have confidence in your abilities.
  - b. teeth can shift in position after preparation unless the provisional restoration provides for positional stability of the tooth.
  - c. it will help the patient not bite on their cheek while waiting for the final restoration.
  - d. None of these statements are true; the temporary is important only for pulpal protection.
8. **If patients break their provisional restorations or they come off the tooth preparation, they should be instructed to:**
  - a. not worry and wait until their next scheduled appointment.
  - b. cover the tooth with orthodontic wax until their next appointment to minimize sensitivity.
  - c. call the office as soon as possible to schedule an appointment to remake the provisional restoration.
  - d. take a pain medication if the tooth hurts and wait until their next scheduled appointment.
9. **The choice of a prefabricated temporary crown will usually be made for a single tooth crown. The reason why a tooth will have a crown preparation and crown can be due to:**
  - a. trauma and fracture of the tooth.
  - b. fracture of an existing restoration.
  - c. caries under an existing crown.
  - d. all the above can be reasons a tooth needs a crown preparation and crown.
10. **Prefabricated temporary crowns are made from:**
  - a. polycarbonate.
  - b. stainless steel.
  - c. aluminum.
  - d. composite resin.
  - e. All the above.
11. **A provisional restoration made with acrylic resin can be fabricated by:**
  - a. using a carrier (template) fabricated prior to the tooth preparation appointment.
  - b. pouring acrylic resin over the tooth preparation, allowing the patient to bite down and allowing it to completely harden in place. Trimming is done on the tooth.
  - c. using a custom shell that is relined on the tooth preparation at the time of tooth preparation.
  - d. Both a and b.
  - e. Both a and c.
12. **The benefits of bis-acryl resins over acrylic resins as provisional restorations include:**
  - a. less shrinkage than acrylic resin.
  - b. resistance to occlusal wear.
  - c. rapid setting.
  - d. All the above.
13. **All the following have been described in the dental literature as a carrier (template) for provisional restorations EXCEPT one. The EXCEPTION is:**
  - a. warmed wax.
  - b. Vacuum formed polypropylene matrices.
  - c. cotton gauze wetted with glycerine.
  - d. vinyl polysiloxane impression material in a tray.
14. **Acrylic resins may cause problems because they:**
  - a. can cause pulpal irritation due to the heat of the exothermic reaction.
  - b. can cause gingival trauma due to the heat of the exothermic reaction.
  - c. are more difficult to mix with a consistent powder-liquid ratio that can lead to issues with timing to determine when to remove the temporary during fabrication.
  - d. all the above are issues with acrylic resins.
15. **Bis-acryl can be reinforced when used for long span bridges by:**
  - a. increasing the setting time.
  - b. adding fiber reinforcement to the restoration.
  - c. adding flowable composite resin to a channel prepared in the occlusal surface of the restoration.
  - d. increasing the setting time.
16. **Protemp Crown is an innovative prefabricated, tooth colored crown. It is made from:**
  - a. aluminum.
  - b. stainless steel.
  - c. composite resin.
  - d. acrylic resin.
17. **According to laboratory testing, the composite resin used for Protemp Crowns has a volumetric polymerization shrinkage that is significantly less than acrylic resin. The polymerization shrinkage of the this composite is:**
  - a. 1.7%.
  - b. 5.0%.
  - c. 12.4%.
  - d. 15.0%.
18. **When compared to polymethyl methacrylate, the acrylic composite resin of Protemp Crown has:**
  - a. the same compressive and tensile strength.
  - b. less compressive and tensile strength.
  - c. twice the compressive strength and two and half times greater tensile strength.
  - d. greater compressive strength but less tensile strength.
19. **To select the size of Protemp Crown that will be used on a molar or premolar, one should:**
  - a. use the provided single patient use disposable gauge to measure the mesial-distal dimensions between the adjacent teeth.
  - b. use the chart provided in the kit to determine the correct size of crown needed.
  - c. take them out of the box until you find the one that fits.
  - d. Both A and B.
20. **TRUE or FALSE: After the Protemp Crown has been trimmed and placed on the tooth preparation, gently compress the crown on the buccal and lingual surfaces of the teeth using your gloved fingers for initial adaptation and take a composite instrument to adapt the crown on the buccal surface and push the crown composite to have the marginal ridges of the adjacent teeth at the same height. With the composite instrument holding the buccal contour, the patient should bite down on the Protemp Crown to establish occlusion before tack curing the crown on the buccal surface for 2-3 seconds with a curing light.**
  - a. Both statements are true.
  - b. The first statement is true, the second statement is false.
  - c. The first statement is false, the second statement is true.
  - d. Both statements are false.

1. (A) (B) (C) (D)
2. (A) (B) (C) (D)
3. (A) (B) (C) (D)
4. (A) (B) (C) (D)
5. (A) (B) (C) (D) (E)
6. (A) (B) (C) (D)
7. (A) (B) (C) (D)
8. (A) (B) (C) (D)
9. (A) (B) (C) (D)
10. (A) (B) (C) (D) (E)
11. (A) (B) (C) (D) (E)
12. (A) (B) (C) (D)
13. (A) (B) (C) (D)
14. (A) (B) (C) (D)
15. (A) (B) (C) (D)
16. (A) (B) (C) (D)
17. (A) (B) (C) (D)
18. (A) (B) (C) (D)
19. (A) (B) (C) (D)
20. (A) (B) (C) (D)

### SIMPLIFIED SINGLE CROWN PROVISIONAL RESTORATIONS

Continuing Dental Education Course

Order number [3971-071]

NAME: \_\_\_\_\_

TITLE: (CIRCLE ONE)    DDS    DMD    RDH    CDH    RDA    CDA    EFDA

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

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**INSTRUCTIONS:** When you finish reading the course text, use the form to submit your answers to the self test. Fill in the correct box for each question indicating your answer. Pen or pencil may be used. There should be only one correct answer for each question. Upon completion of the course, mail the answer sheet to: Benco Dental, Attn: Education Department, 295 CenterPoint Boulevard, Pittston, PA 18640

**NOTE:** We recommend that you photocopy your answers before mailing this course. This will ensure that you have a record of your course completion in case of loss due to postal system error.

**COURSE EVALUATION:** Please take a moment to answer the questions below. Your responses will help us in develop future course material. Your feedback is important in evaluating the content and value of our courses. Please indicate how well the course met the criteria below. Circle one number in each criteria: 1=Poor, 2=Average, 3=Good, 4=Excellent.

e course provided clear information about the topic.	1	2	3	4
e course had relevance for my practice.	1	2	3	4
Overall rating	1	2	3	4
e course evaluated my understanding of the topic through the post-course questions.	1	2	3	4

How likely would you be to take a similar course on a different topic in the future?  
 highly unlikely     highly likely

On a scale of 1-5 (5=Excellent, 0=Poor), please rate the following:

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Course Content	0	1	2	3	4	5
Author's Grasp of Topic	0	1	2	3	4	5
References	0	1	2	3	4	5
Overall Effectiveness	0	1	2	3	4	5

Was the course clearly written and easy to understand?     Yes  No

If no, please describe: \_\_\_\_\_

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 \_\_\_\_\_

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