

Fabrication of Immediate Direct Thermoplastic Whitening Trays



Van B. Haywood, DMD
Professor

Department of Oral
Rehabilitation
School of Dentistry
Medical College of Georgia
Augusta, GA
Phone: 706.721.2554
Fax: 706.721.8349

**W. Frank Caughman,
DMD, MEd**
Professor and Chair

Kevin B. Frazier, DMD
Associate Professor

Michael L. Myers, DMD
Professor and Vice Chair

TRAY FABRICATION, STEP BY STEP



Figure 1—The Dual Tray System consists of an outer blue tray to carry the white inner tray to the mouth.



Figure 2—The tray assembly is softened in hot water with a waving motion until the blue tray becomes flexible.



Figure 3—The softer inner white tray is adapted to the outer blue tray before insertion in the mouth.



Figure 4—After seating the tray system, custom adapt the tray by squeezing on the facial and lingual surfaces of the teeth, beginning at the midline and working posteriorly.



Figure 5—Ask the patient to create a vacuum with suction and lightly bite into the tray system.



Figure 6—Test the fit of the tray by reseating it while it cools. If loose, press and vacuum more; if tight, continue to seat and reseat to stretch.



Figure 7—Once the tray is cooled, remove it from the mouth, and remove the inner white tray.



Figure 8—Discard the outer blue tray, evaluate and adjust the edges and occlusion, and the patient is ready to begin whitening.

1. Heat 10 oz to 12 oz of water in a microwave oven on "high" (for approximately 1.5 minutes). The water should feel hot, but tolerable to a gloved finger.
2. Submerge the tray assembly into the heated water while shaking it to remove any bubbles trapped between the trays (Figures 1 and 2).
3. Slowly move the tray assembly in the water by the handle until the handle becomes very flexible. A slight loss of shape will be noticed as the horseshoe collapses when the tray is sufficiently softened.
4. Remove the tray assembly from the water and make sure both components are well adapted together. Use your finger to slightly flatten and flare the anterior and posterior segments of the tray to prevent the tray from folding on itself, and to adjust for the length of the incisors (Figure 3).
5. Center the tray assembly over the anterior teeth so the facial surfaces of the central incisors will be covered by the inner white tray.
6. Adapt the tray intraorally. Press firmly on the facial and lingual aspects of the tray assembly with the index finger and thumb of both hands. Begin at the midline and work posteriorly (Figure 4).
7. Remove your hands and ask the patient to purse his or her lips around the tray assembly and try to "suck the water out of the tray" while pressing with the tongue on the palate. Repeat this exercise three to four times (Figure 5).
8. With lips still together in suction, have the patient bite lightly a few times.
9. Pump the tray assembly off and back on without completely removing it. As it cools, the tray will shrink. If the tray does not feel tight, continue adapting it by squeezing on the sides, or by having the patient continue the pursing/sucking exercise. If the tray is too tight, continue seating and unseating. This pumping action can stretch the tray as it cools and may be repeated as many times as needed (Figure 6).
10. When the patient no longer feels any heat in the tray assembly, remove it from the mouth and separate the white insert from the blue tray holder. The white insert is the custom-fitted tray that will be used for whitening (Figure 7).
11. Evaluate the white tray intraorally for adaptation or sharp edges. Areas that are rough should be reheated by dipping that portion only in the hot water (for about 5 seconds). The flexible tray is then repositioned and smoothed by rubbing it with gloved fingers.
12. Evaluate the occlusion. Occasionally, the trays can create a prematurity in the posterior segment. To adjust the occlusion, dip the posterior portion of the white tray into the remaining hot water until softened, reposition it in the mouth, and have the patient lightly close together into maximum intercuspation. The unsoftened anterior portion of the tray will help prevent overclosing. Repeat this process until a stable occlusion is achieved.
13. If a major amount of tray material in the gingival area must be removed, this can be done with sharp, sturdy scissors, or with an acrylic bur in a slow-speed handpiece. However, in the authors' experience, smoothing by reheating with warm water and applying finger pressure leaves a better finish (Figure 8).

Continued

At-home whitening using a custom tray to apply a carbamide peroxide solution is gaining increasing popularity around the world. New innovations continue to make the treatment more accessible. One such innovation involves a tray fabrication system that does not require an alginate impression, but still provides the dentist and patient with the advantages of a custom-fitted tray. A recently introduced, directly formed thermoplastic tray (Dual Tray System, ArchTek Inc.) consists of a disposable outer tray holder, which is used to carry an inner treatment tray to the mouth for adaptation (Figure 1).¹

CHARACTERISTICS OF THE SYSTEM

The immediate thermoplastic tray system provides a number of advantages. First, there is no need for an alginate impression. This benefits both the patient and dentist. Generally, the thermoplastic tray can be fabricated in approximately the time it takes to make a quality impression. Another advantage is that the patient can begin whitening the same day as the diagnosis appointment.

The patient does not have to deal with an unpleasant procedure and the dentist saves valuable chairtime and laboratory expense.

There are some limitations to the tray system. Patients with unusual arch sizes or shapes, or patients with limited access, may not be good candidates for this tray. The mandibular arch is also more difficult to fit because of the tongue and access for molding. Additionally, patients who wish to wear the tray during the day may not like the conspicuousness of its white color.

There are several indications for this tray system, in addition to the typical at-home whitening patient. For patients who have

whitened their teeth with conventional whitening trays, this thermoplastic tray system can be used as a touch-up option when postwhitening restorative work renders the original trays unusable. Also, the system is indicated for young patients in the mixed dentition stage, for whom a more conventional tray is short-lived as a result of the

changing nature of their dentition. In the highly-motivated patient, this tray can be used to initiate whitening while a conventional custom tray is being fabricated. In addition to its use as a whitening tray, this tray system could provide an immediate splint for a patient who suffers from temporomandibular disorder, or serve as a carrier for vari-

ous medicaments in the treatment for tooth sensitivity² or caries. ○

REFERENCES

1. Haywood VB, Caughman WF, Frazier KB, Myers ML: Feasibility of immediate direct thermoplastic whitening trays [abstract]. *J Dent Res* 77:273, abstract 1337, 1998.
2. Haywood VB, Caughman WF, Frazier KB, Myers ML: Tray delivery of potassium nitrate-fluoride to reduce bleaching sensitivity. *Quintessence Int* 32:105-109, 2001.