



## PRODUCTION OF TEMPORARY CLINICAL CROWNS

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### ABOUT ARTICLE

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**Abstract:** Temporary crowns are of critical importance in orthopedic treatment. The term "temporary restorations" refers to those that have been installed for some time and require subsequent mandatory replacement of the restoration. Even if the final restoration is installed soon after dissection. Unfortunately, the word "temporary" implies some negligence, which often means ignoring many of the requirements related to permanent restorations. If such a connotation becomes the philosophy of the intermediate stage of treatment, it will necessarily lead to a decrease in clinical effectiveness and overall quality of treatment.

### INTRODUCTION

Strict observance of all the rules and conditions for the manufacture of temporary restorations is never a waste of time.

**Materials and tools used:**

- C-silicone (Speedex, base and activator)
- Composite material for the manufacture of temporary crowns (Hexa-Temp)
- Disposable scalpel No. 11
- Insulating (separating) material (vaseline)
- Straight tip with a milling cutter
- Cement for temporary fixation Temp Bond (or any other for temporary fixation)



Removing the silicone key

- Removing the silicone key is one of the most important steps, as the quality and accuracy of manufacturing a temporary structure depends on it.
- It is necessary that the impression includes adjacent teeth from the prepared ones, for its further correct positioning in the oral cavity.
- When preparing all teeth of the upper jaw, it is necessary to capture part of the hard palate when making a silicone key, this additional area will facilitate the positioning of the impression in the oral cavity.
- When preparing all the teeth of the lower jaw, it is necessary to capture the alveolar process from the oral side, this additional support will facilitate the positioning of the impression in the oral cavity.
- In cases of preparation of all teeth on the upper or lower jaw, it is recommended to use a standard impression spoon of the appropriate size, this will avoid many difficulties and inaccuracies.

### **Possible errors at this stage**

Taking an impression only from the teeth being prepared.

The reason: the lack of a clear plan for the manipulations carried out can lead to the production of an impression without including adjacent teeth, and other areas that allow the silicone key to be correctly positioned in the oral cavity, temporary structures made according to such an impression will be incorrect in occlusal ratios and will require significant refinement.

Solution: re-manufacturing of a silicone key with the inclusion of adjacent teeth and areas in the impression that allow the impression to be positioned correctly.



The braces are in a silicone key.

Reason: at the time of the polymerization stage of the silicone mass, an attempt was made to untimely change the shape of the silicone key, this may occur due to non-compliance with the working time with the material or an incorrect mixing ratio of the silicone mass.

Solution: re-manufacturing of the silicone impression, otherwise the accuracy of the manufactured temporary structures will be mediocre, it will take more time to process such structures than to re-manufacture the impression.

The presence of "unrecognized" areas of the teeth being prepared.

The reason: the manufacture of a silicone key without using a standard impression spoon, especially in areas with difficult access (for example, the lower molars) leads to the presence of "unrecognized" areas, this is often observed in the area of the lower molars.

Solution: re-manufacturing of the silicone key using a standard impression spoon, its use will facilitate obtaining a satisfactory impression, otherwise temporary structures made using an invalid impression will require long-term refinement.

### **Preparation of the silicone key**

The manufactured silicone key must be prepared as follows:

From the vestibular side, using a scalpel (or a silicone knife), the impression is cut off along the zenith of the teeth to allow the outflow of excess material.

On the oral side, shallow furrows are created coming from the base of the gingival papillae, thus creating space for the outflow of excess material. To create such depressions, it is especially convenient to use a knife for cutting channels in silicone, or a knife in the shape of a spoon.



Silicone knives can be used instead of a scalpel.

### **Possible errors at this stage**

The absence of oral depressions.

The reason: this error is often made from haste and inattention, the absence of these depressions will lead to the spread of excess material over the palate or sublingual area, this can make it difficult to extract the structure from the oral cavity and cause unpleasant sensations in the patient.

Solution: monitoring compliance with the stages of manipulation.

Inaccuracy in the processing of the vestibular area of the silicone key.

Reason: imperfection in the use of a silicone knife or scalpel can lead to excessive removal of silicone mass in the cervical region of the teeth being prepared, or vice versa, insufficient removal of silicone

mass. Temporary structures in such cases will have overhanging edges, inaccurate posterior fit, and it will take a little more time to process such structures.

Solution: practicing manual skills in preparing silicone prints.

### **Preparation of teeth**

The preparation consists in hemostasis and covering the teeth with a thin layer of vaseline so that the manufactured structure can be easily removed from the prepared teeth.

In cases where there are new composite restorations on the teeth being prepared, or the stump of the tooth has been restored with composite material, it is necessary to abundantly cover such areas with vaseline. Otherwise, an adhesive bond will occur between the material for the manufacture of temporary structures and the composite restoration and it will be impossible to remove the temporary structure without compromising the restorations.

Before inserting the silicone key with the material into the oral cavity, it is recommended to try on the impression without the material in order to determine the route of administration and its correct position.

### **Possible errors at this stage**

The absence of a separating layer

The reason: neglecting the stage of coating teeth with a layer of vaseline or other separating material will lead to difficult, and in the presence of new composite restorations, it will be impossible to extract temporary structures for further processing.

Solution: monitoring compliance with the stages of manipulation.

Insufficient hemostasis in the area of prepared teeth.

Reason: neglecting careful hemostasis of the gum will lead to blood entering the material, the presence of blood inclusions in the temporary structure will lead to the formation of pores, in some cases it is not possible to completely remove or wash away blood inclusions from the material, which will lead to darkening of the inclusions and unsatisfactory aesthetics of the temporary structure.

Solution: paying attention and time to thorough hemostasis.

Stage 4. Adding material to the silicone key

Before applying the material, it is advisable to squeeze out the first small portion of the composite from the cannula, since this first portion does not mix well enough and may remain viscous, which will lead to voids.

The material is introduced into the silicone key slowly, starting from the occlusal surface continuously, in one portion, this method of introducing the composite will avoid the appearance of pores. Next, a portion of the material is applied to the ledge of the prepared teeth, this allows for a good edge fit of the temporary structure, this stage is especially important during deep subgingival preparation.

Possible errors at this stage

Pores when applying the material to the silicone impression

Reason: if the material is introduced into the impression in several inhomogeneous portions, or the material is introduced from the posterior region of the impression, and not from the occlusive one, voids are likely to form in the manufactured structure. Such a temporary structure cannot be polished to a perfectly smooth surface, in most cases it has an unsatisfactory edge fit and aesthetic disadvantages.

Solution: application of the material in one homogeneous portion starting from the occlusal surface of the impression.

Stage 5. Inserting a silicone key into the oral cavity

A silicone key with the material is inserted into the oral cavity and positioned.

After 90 seconds, the silicone key is removed along with the structure (the time may vary depending on the manufacturer and the material used), in most cases the structure remains in the impression, if the structure remains on the teeth, it must be carefully removed from the oral cavity for further processing.

Possible errors at this stage

Insufficient or excessive polymerization of the material.

Reason: Failure to observe the operating time and deviation from the manufacturer's instructions can lead to significant difficulties. If the silicone wrench is in the oral cavity for less than the recommended time for initial polymerization, then the material will remain viscous when removed. If the silicone key is removed later than the recommended time, the material will shrink and it will be very difficult to remove the structure from the prepared tooth.

Solution: re-manufacture of a temporary structure with strict observance of the working time of the material used.

Stage 6. Polishing and processing of crowns

During the polymerization of composite materials, a sticky oxygen-inhibited layer forms on their surface. You can remove this layer using ethyl alcohol.

After removing the inhibited layer, using a straight tip and a cutter, all sharp edges are eliminated, the posterior area of the crown is necessarily thinned to prevent gum pressure, the crown is contoured and polished to a smooth surface.

If the structure is made for a long time or will be located in an aesthetically significant area, it can be varnished for temporary structures, this will give it a glossy sheen and prevent it from staining with coloring products.

Possible errors at this stage

The presence of sharp edges, unsatisfactory polishing.

The reason: careless processing of the structure will lead to the presence of sharp edges and roughness, which will cause discomfort to the patient, and will necessarily lead to immediate re-admission.



Solution: careful processing and polishing of the temporary structure.

The presence of a thick posterior edge.

The reason: the absence of thinning of the posterior edge of the temporary structure leads to compression of the gum, which leads to its inflammation and discomfort.

Solution: monitoring compliance with the stages of manipulation.

Stage 7. Fixation

The manufactured structure is fixed on Temp Bond temporary cement, excess cement is removed.

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