

Complete Denture Duplication

A duplicate denture is a second denture intended to be a copy of the first denture.

Synonyms: Copy dentures, Template dentures, Replica dentures.

Aims

1. The transfer of contours from old to new dentures for maintenance of neuromuscular control.
2. Any modifications done to the basic shape of the old denture should therefore be only those necessary to correct the loss of fit i.e., (patient's complaint) and those considered essential by the operator, e.g., slight increase in the OVD and the replacement of the worn denture teeth.

Indications

1. When it is desirable, especially for the older patients, to provide replacement dentures (with improved fit) similar in most aspects to those to which patients are already accustomed. It is not easy for a geriatric patient to get used to a new denture with altered polished surface contours readily.
2. If we desire to renew old deteriorated and stained denture base material, the duplicate denture will have the appearance of being completely new.
3. If it is desired by a patient to have a spare denture in case of accidentally fracture or loss of the original denture. The patients often are concerned about being without dentures during required repair or relining process.
4. If we need to experiment interchanging the occlusal relationship of the dentures – for clinical or research reasons. This could be carried out on the spare denture, without changing the original one.

Contraindication

Any serious defect of the denture prosthesis.

So careful evaluation of hard and soft tissue and the prosthesis is done before duplication.

Advantages

1. Can make copy denture (usually) without damaging the old ones.
2. No period for the patient to be without dentures as occur in reline or rebase.
3. Copy dentures enhance neuromuscular adaptation to new dentures.
4. Reduce patient-clinician chair side time.
5. Reduce laboratory steps.
6. Require fewer patient visits.
7. Make jaw relation registration simple.
8. Provide technical staff with more guidance to tooth position and moulds.
9. Allows for copying esthetics.
10. Cost effective.

Disadvantages

Large errors in the original denture are difficult to be corrected and the procedure is only used in complete denture prosthesis

When to Duplicate a Denture?

- We are not going to duplicate a denture unless its examination reveals satisfactory findings as regards to esthetic, physiologic, and psychologic needs of a patient.
- The denture(s) should be evaluated for any previous fractures, craze lines, missing or replaced teeth, esthetics, phonetics, accuracy of fit, and vertical and centric relations.
- On the basis of this examination, the patient is then advised whether the existing denture should be duplicated or remade.

Temporary Duplicate Dentures

Production of temporary duplicate dentures is sometimes carried out with the aim that these can be progressively modified if the patient's capacity to adapt is in doubt (e.g., gradual increase in occlusal vertical dimension) or if the cause of the patient's complaints is not clear (e.g., patient may be a denture collector).

These could be fabricated with low cost and with less clinical and laboratory time. Once a satisfactory appliance has been achieved, it can then be copied to produce a definitive denture.

Steps of duplication

Clinical stage 1:

At the first appointment, any modifications desired are made to the existing denture:

- Gross corrections to the peripheral extension using low fusing impression compound, greenstick or acrylic border moulding material
- Add a labial flange if the existing denture was open face (if required)
- A wax wafer is used to register the occlusion. Typically due to alveolar resorption and/or wear of the existing artificial teeth, the occlusal vertical dimension of the dentures is proportionally increased. This is done by adding wax to the occlusal surfaces of the teeth. The height is added to the upper, the lower, or both.
- Choose the shade (could be the same or a new shade as required)

Laboratory stage 1: Make replicas

- Wax or self-curing acrylic resin replicas are poured. Typically the occlusal surface is made from wax, and the fitting surface is made from acrylic
- The wax teeth are replaced with artificial teeth of the same size and shape as in the existing denture, in the required shade
- The replicas are sent back to the clinic

Clinical stage 2: Wax try-in & wash impression

- A try-in of the replicas
- Any errors in the position of the teeth are corrected. If the errors are significant, the instructions sent back to the lab and this stage needs to be repeated
- When the replicas are deemed suitable, **Wash impressions** are made (a thin-layer impression using the try-in as a special tray, which identifies the small dimensional changes that have occurred as a result of alveolar resorption since the time the original denture was made). Any undercut must be removed using a bur, the periphery is reduced, and the polished surface of the replica is coated with Vaseline. The wash impression are made using zinc-oxide/eugenol, low-viscosity elastomer (if soft tissue undercuts are present) or light-bodied silicone in the closed mouth technique, reproducing the occlusion.
- The post dam is marked

Laboratory stage 2: Finish

- Stone casts are poured from the impression, preserving the functional borders
- The acrylic palate, if one was used in the upper denture, is removed and an even-thickness palate is waxed up and then the final acrylic dentures are made.
- Flask, pack and finish

Clinical stage 3:

- The copied dentures are tried, and adjusted if needed.

A review appointment in about 1 week is usually booked, when typically further smoothing of any rough edges is required.

Techniques for Denture Duplication

A number of methods or techniques have been reported for producing a template for a duplicate or copy denture. All these techniques are similar except in the use of mould container and materials. Some of these methods are,

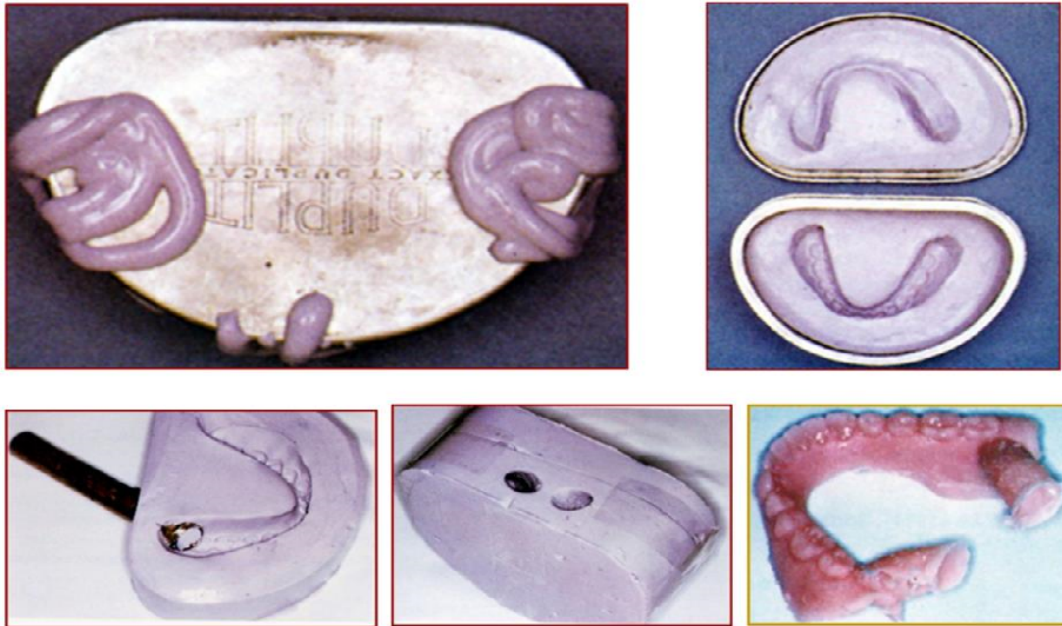
- Modified denture flask method
- Duplicating flask method
- Pour resin flask method
- Cup flask method
- Soap container method
- Agar container method



Basically, a mould of the old denture is produced in an elastic material, such as alginate or silicon putty supported in a rigid container. The wax or auto-polymerizing resin template is fabricated from this mould. Any necessary modifications to the old denture are performed on this template denture and tried – in the patient's mouth before finishing the prosthesis. In some of the techniques, auto-polymerizing resin teeth are also fabricated instead of using available ready-made mould, especially for the temporary duplicate dentures.

Denture duplication with duplicating flask

The denture is submerged in alginate. When the alginate is set, any flash of material on the base is trimmed with a sharp knife. The flask is then filled with a new mix of alginate, and the lid is closed. Alginate halves are separated and the denture is removed. Sprue holes are then cut into the posterior border of alginate mold. The impression is reassembled and held together with adhesive tape. Auto-polymerizing resin is then run into one of the sprue holes until it rises from the other. Lastly, the duplicate monochrome denture is removed from the flask and mounted on a suitable articulator. Then the pink colored teeth are replaced by the selected mold of the teeth. The dentures are now processed, finished and polished with routine laboratory procedure.



Modified flask method using silicone impression material

Modified flask method using silicone impression material for denture duplication. Silicone rubber was painted on the tissue surface of the denture and a piece of gauze of appropriate size was put on the silicone layer to increase retention between silicone and stone and then the stone was added. The denture with the silicone rubber lining and stone cast was invested in the lower half of a flask. A uniform layer of silicone rubber approximately 3-4 mm thick was applied to the polished surfaces of the denture and to the teeth. The upper half of the flask was placed in position on the lower half and the flask was filled with plaster. After half an hour, the denture was removed from the flask and the teeth of the same shade and mould were placed. The mould was filled with a pour-in type of auto-polymerizing resin and the flask was closed and held under pressure until the resin set. The duplicate denture was removed, trimmed and polished.

Pour resin method

Boss and carpenter designed a special flask to be used with reversible hydrocolloid for making the mould. Tooth shade-auto polymerizing resin was painted into the tooth indentation with a brush and pour type of auto polymerizing resin was used to form the duplicate denture in the mould. The disadvantages involved were the requirement of a special flask and the equipment and formation of voids.

Cup flask method

Wagner in 1970 has described a method of duplicating complete dentures by using reversible or irreversible hydrocolloid and a cup as a flask. Singer has modified the method by introducing a particularly convenient zipper technique that uses dental floss to section an alginate irreversible hydrocolloid mould poured in a 12- ounce ceramic cup. Pour type of resin and tooth coloured auto-polymerizing resins were used to fabricate duplicate dentures.

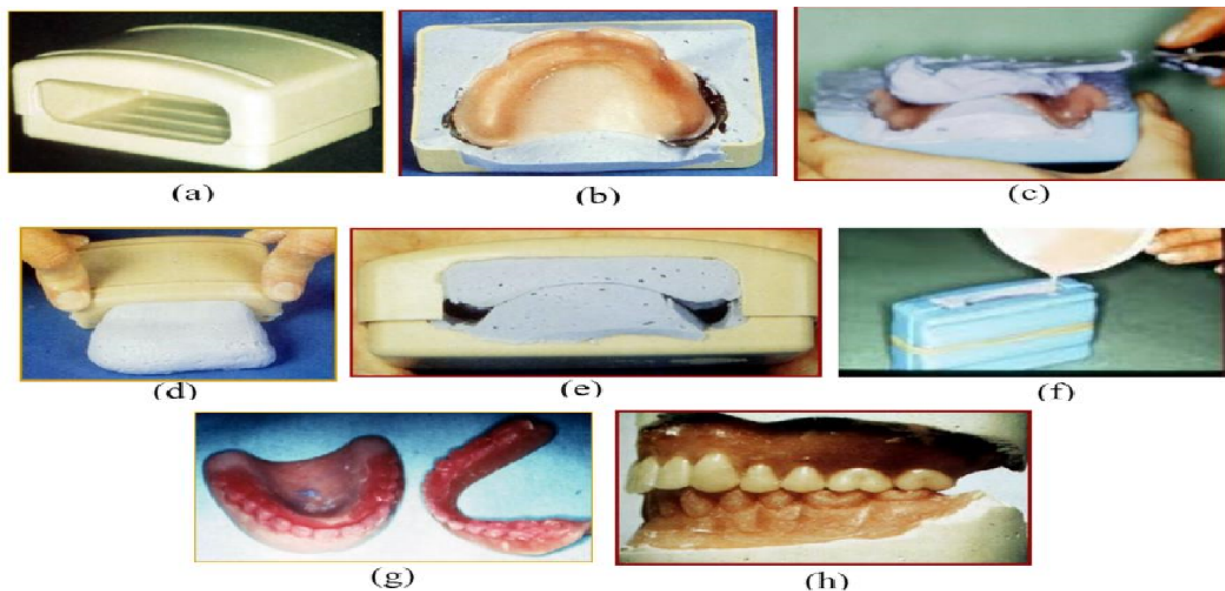
The soap container method

In this method of denture duplication the original denture borders are modified with green stick compound. It is then submerged in alginate in the soap container, denture invested in the lower part of the container.

A second pour of alginate to complete the investment. The soap container should be pressed from sides to avoid its distortion. Two halves are then opened and the sprue holes are cut with a sharp knife. The halves are then re-assembled and can be held together with elastic bands.

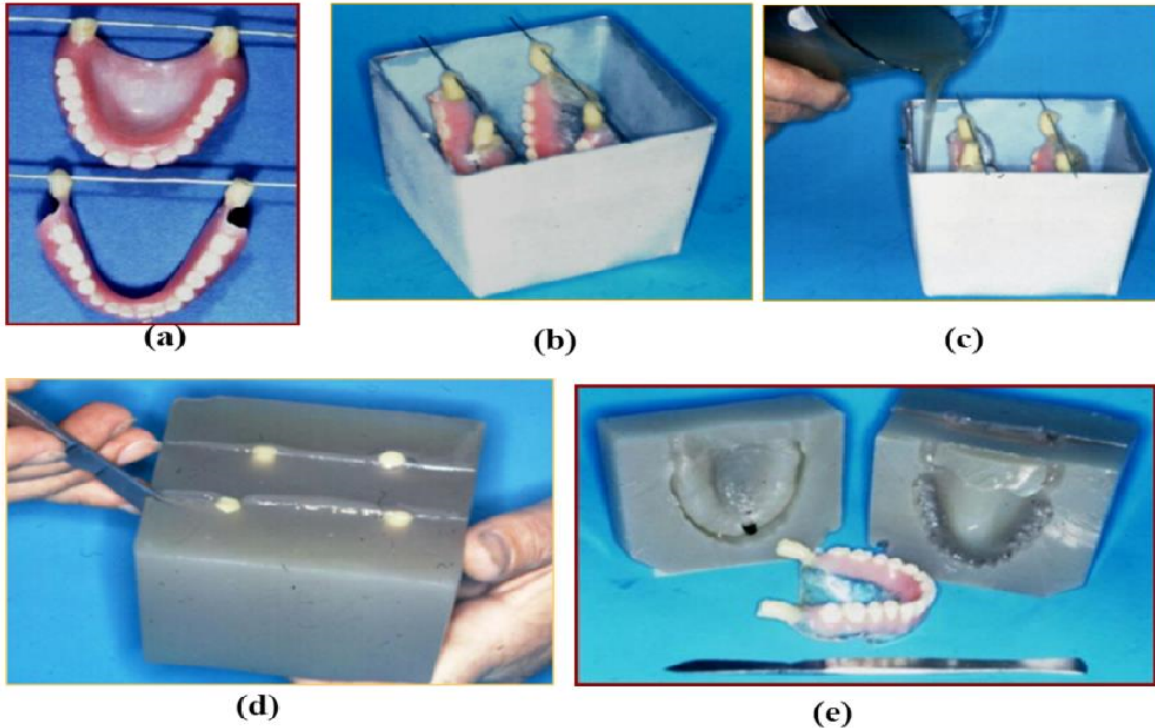
Self-cure resin is being poured down one of the holes with light vibrations, while air escapes from the other. place the container with the sprue holes upright in a pressure pot that contain water at 110 F and process the resin under 15-30 psi pressure for 30 minutes.

The waxed or auto-polymerized duplicate dentures are then recovered from the moulds. The wax teeth on one of the dentures are then replaced with the identical mould of the resin teeth.



Agar_ agar method

Denture are suspended with a metal rod through the sticky wax sprues. Both dentures are suspended in the agar container. Molten agar is poured in the container. Once agar is set, the mould is sectioned through the sprue holes to retrieve the dentures.

**Denture Duplication Technique Modifications / Further applications**

1. Addition of a labial flange to the open-face denture.
2. Production of temporary dentures. Teeth are fabricated with dentin colored self-cured acrylic resin before adding tissue colored pink denture base resin.



Problem Areas in Fabrication & Solutions

1. Rigidity of the box. The container used for fabricating the alginate mold must be rigid to avoid distortion of the alginate and subsequently the self-cured acrylic resin template. Precautions must be taken so as the rubber bands used to hold two halves of the mold must not distort the soap container.
2. Distortion of the Alginate ridge. Immediately after pouring the wax to form template teeth, the mold should be reassembled to check that the alginate impression of the ridge does not indent the soft wax. Wax is removed if necessary to avoid any possible distortion of the alginate ridge and production of a base plate without an intact all-acrylic resin impression surface.
3. Impression & jaw relation records. These steps should be performed with utmost care. Silicone impression material is recommended for obtaining the reline impressions as the template dentures have to be re-inserted in the mouth for recording the OVD and Centric Relation.
4. Tooth position and tissue contours. Since the spatial positioning of the teeth and the resin contours of the polished surfaces are important for neuromuscular control, the selection and placement of the stock (ready-made) teeth on the templates must be undertaken with great care.



