Tishk International University
Dentistry Faculty
Dentistry Department

Prosthodontic lectures/
Complete denture

Lecture No.: 4
Impression Material Used For Complete Denture/part: 1
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**DEFINITION:**

*Dental impression* is defined as the negative record of the tissues of the mouth.

*Complete denture impression:* it's a negative registration of the entire denture bearing, stabilizing and seal area of either the maxilla or the mandible.

So, in the case of an edentulous arch, this requires a unique combination of managing movable soft tissue corresponding with different materials and a technique for accurate reproduction.
**Requirements of impression material:**

1. Must be a semi-liquid material that will flow and adapt itself around the structure of interest.
2. It must set and harden into a solid that is rigid enough to be removed from the mouth without becoming deformed.
3. Copy details accurately
4. Dimensional stability after removal from the mouth.
5. Appropriate working time (from the start of mix).
6. Appropriate time to harden in the mouth (setting time).
8. Chemically compatible with material used to pour cast.
Objectives Of Impression Making:

Complete denture impression procedures must provide five objectives:

1. Retention
2. Stability
3. Support for denture
4. Aesthetic
5. Preservation of the residual alveolar ridge and soft tissue.

**Retention:** Is the resistance of the denture to remove from the mouth by resisting displacement forces at right angle to the occlusal plane.

**Stability:** Is the quality of prosthesis to be firm, steady or constant to resist displacement by functional horizontal or rotational movement.

**Support:** Is the quality of prosthesis to resist displacement from the denture supporting foundation; therefore, the greater the amount of area covered the greater the support.
Retention is the constant relation of the denture base to underlying soft tissues, while stability is the relation of the denture base to underlying bone. These relations may be constantly changing.

Retention must hold the denture in its position when it is set at rest.

Stability must resist displacement by rocking when a force is applied to teeth over a limited area.

The best support for denture is the compact bone covered with fibrous connective tissue.

* Retention = Denture base + Soft tissue.
* Stability = Denture base + Bone.
* Support = Denture base + Bone + Soft tissue.
**Aesthetics:** Border thickness should be varied with the need of each patient in accordance with extend of residual ridge loss. The vestibular fornix should be filled, but not overfilled, to restore facial contour.

**Preservation of the residual alveolar ridge and soft tissue:** preservation of the remaining residual ridge is physiologically accepted that with the loss of the stimulation of the natural teeth, the alveolar ridge will atrophy or resorb.

* Prosthodontist should keep in mind the effect of impression material and technique on the denture base and the effect of the denture base on the continued health of both the soft and hard tissues of the jaws.

**CLASSIFICATION**

There are many types of classification, the most common classification used in complete denture construction is based on type of impression and area of use.

**Primary Impression**

**Primary impression:** it is a negative likeness made for the purpose of diagnosis, treatment planning, or the fabrication of a tray. It is the first impression made for the patient and from which the study cast was produced. This impression is obtained by a stock tray.

- For the upper stock tray, the posterior border of the tray should cover the maxillary tuberosity and hamular notch, anteriorly should include the anterio- alveolar ridge.
- * For the lower stock tray posteriorly should cover the whole area of retromolar pad area and anteriorly include the alveolar ridge.
**Materials Used For Making Primary Impression:**

1. Impression compound.
2. Alginate impression material.
3. Rubber base impression material (heavy body).

**Production of study cast (primary cast):**

The primary impression is poured or casted in plaster (after beading and boxing) to get the primary cast or study model which is the positive reproduction of the oral tissues. The plaster mixed with water by the saturation method in the rubber bowel. When the plaster became hard, the cast is separated from the impression by the use of hot water (55-60 °C). When using very hot water, the impression compound will be sticky and it will be difficult to remove from the cast. The special tray will be constructed on the primary or study cast which is used to make final impression. After construction of special tray, it is tried in the patient mouth and checked for proper extension and adaptation on the alveolar ridge, as good impression cannot be obtained unless this step is made. So a correct special tray is a primary fact in obtaining a good working impression.
Final or secondary impression:

Final or secondary impression (for edentulous patient that use for complete denture construction): It is a negative likeness or registration of the entire denture bearing, stabilizing area and border seal area of the mandible and maxilla for the purpose of fabricating a prosthesis. The final impression is made with special tray and it is used for making master cast which must be poured with stone material.

Master cast (definitive or final cast): A replica of the tooth surfaces, residual ridge areas and or other parts of the dental arch and or facial structures used to fabricate a dental restoration or prosthesis.

Materials used for final impression:

1. Zinc oxide eugenol impression material (ZOE).
2. Alginate impression material.
3. Impression plaster.
4. Elastomers impression material:
   a- Polysulphide (rubber base).
   b- Poly ether. c- Silicon (light body).
5. Waxes.

The techniques used for making final impression:

1. Mucostatic impression technique (non-pressure technique).
2. Muco-compression or Functional impression technique (pressure or closed mouth technique).
3. Selective pressure impression technique.
Boxing an impression and making the casts Boxing:

Is the enclosure of an impression to produce the desired size and form of the base of the cast and to preserve desired details. Boxing impression can be used for primary and final impression for complete denture.

This procedure cannot usually be used on impression made from hydrocolloid materials (e.g. alginate) because the boxing wax will not adhere to the impression material and the impression material (alginate) will be distorted.

Advantages of boxing:

1. To facilitate pouring the impression with plaster or stone. 2. Produce the desired size and form of the base of the cast. 3. Provide adequate thickness of cast. 4. Preserve desired details and borders of the impression. 5. In the lower impression, boxing makes the reproduction of the lingual borders and tongue space easier.
Common Faults In Impression Making:

1. Poor selection of the tray.
2. Insufficient material loaded in the tray.
3. Excessive material loaded in the tray.
4. Failure to press the tray completely to position (insufficient seating pressure).
5. Excessive seating pressure.
6. Incorrect position of the tray before final seating it (Un centralization).
7. Obstruction of the proper flow of the material by lips, cheek or tongue.