

Ministry of Health of Ukraine

National O.Bogomolets Medical University

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of the Prosthetic Dentistry Department

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Study Guide for Practical Study for Students

Kyiv - 2024

Subject	Prosthetic dentistry
Theme of seminar	Adjusting the borders of an individual impression trays Functional impressions taking from upper and lower jaws. Methods of the individual trays fabrication to the upper and lower jaws. Anatomical requirements for complete denture periphery designing.
Course	The 4th course,
Faculty	Stomatological

I. TOPIC RELEVANCE.

The knowledge of anatomical peculiarities of the oral cavity in edentulous patients is necessary for prevention of complications of prosthesis fixation on edentulous maxilla and mandible. The fixation and stabilization of complete dentures depend on the quality of impressions (anatomical and functional), precise accuracy in these impressions (regarding the relief and functional condition of denture-bearing area). The functional impressions are made using the individual tray, which is selected and fitted in the mouth by means of special tests and border correction. Individual trays may be manufactured in one appointment directly in patients in the oral cavity and in two appointments by technician on primary cast model made with aids of anatomical impression.

Functional impression taking is one of the important stages in a complete denture's fabrication. Its quality depends on the execution success. It is necessary for doctor to give complete denture quality standard, to define its functional and aesthetic value, to teach the patient to use it correctly.

II. STUDY OBJECTIVE

1. To know the methods of making individual trays by Vares and method of making acrylic resin individual trays on the cast model.
2. To know clinical, morphological and functional peculiarities of the oral cavity in edentulous patients.
3. To be able to plan and make examination of the oral cavity in edentulous patients correctly.
4. To be able to interpret the results of clinical and special (supplementary) methods of examination of edentulous patients correctly.
5. To know the main principles of prosthetic treatment and rehabilitation of edentulous patients.
6. To know the methods of laboratory fabrication of individual trays.
7. To know the methods of individual trays fitting using tests by Herbst.
8. To master the methods of making functional impression using individual trays fitting to denture-bearing area with tests by Herbst.
9. Students should know: principal approaches to taking functional impression.
10. Students should know and have concept about: the actual impression techniques and materials usually used.
11. Students should master the following practical skills: the mucostatic, mucocompressive, and the selective mucocompressive techniques of taking functional impression, their fundamentals.

12. Students should be able to master: preparation of individual trays for functional impression. Materials for individual trays fabrication.

III. EDUCATIONAL OBJECTIVE

- To develop in the students feeling of responsibility, deontological principles and clinical mentality during treatment of edentulous patients on the stage of rigid individual trays fitting in oral cavity of edentulous patients.
- To teach students to understand the procedures necessary to create quality functional impression.
- To pay attention of the students to the peculiarities of functional impression for different cases.
- To teach the students main principles of the interaction between the clinician and the dental technician.

IV. INTERDISCIPLINARY INTEGRATION

Vertical integration.

Subject and proper chair	To know	To be able to
Previous Normal anatomy	Anatomical structure of the maxilla and mandible.	To carry out examination of edentulous patient's oral cavity, borders of denture-bearing area on the maxilla and mandible.
Normal physiology	To know anatomical and physiological peculiarities of the oral cavity of edentulous patient	To select the peculiarities of the structure of oral cavity' of edentulous patient
Prosthetic dentistry (orthopedic stomatology)	To know the degree of edentulous maxilla and mandible atrophy	To examine the patient's oral cavity and reveal the degree of edentulous maxilla and mandible atrophy

V. LESSON TOPIC CONTENTS

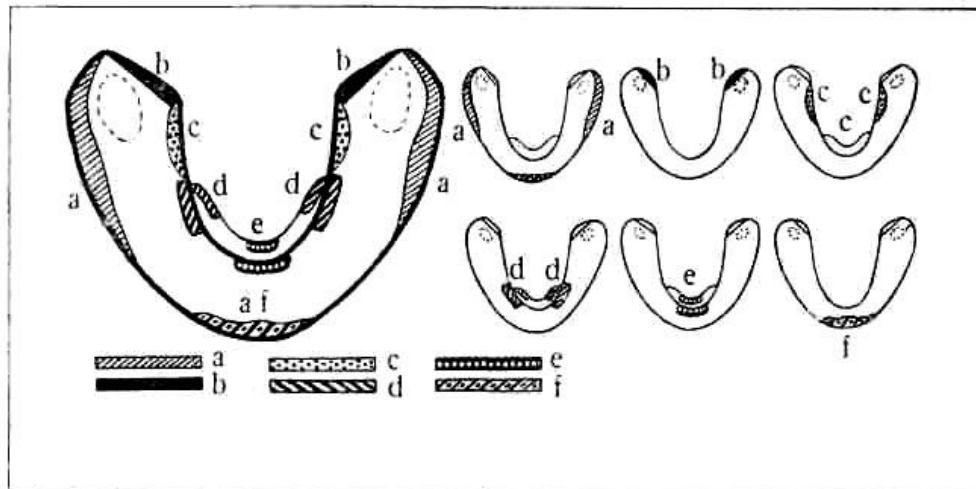
The master cast is made from another impression that is more representative of the denture-supporting structures in function. The stock tray carrying the alginate material probably pushed the vestibule beyond the limit of normal muscle movements around the mouth. The dentist, applying knowledge of functional anatomy, arbitrarily marks the boundary of the primary impression to help guide the construction of the acrylic tray for the master impression. The acrylic tray can be adjusted to accommodate the muscle movements so that the impression material will produce a replica in stone of the residual ridges and of all the surrounding structures that support and retain the denture.

IMPRESSION TAKING AFTER HERBST'S METHOD

First free impressions are taken to which a model is cast and the borders for the preparation of the tray are marked on it. They should correspond to the passive tissues covering the toothless jaws. The impression trays are prepared on the model from two shellac plates placed one on top of the other, and then checked in the mouth so that the impression edges later, can be actively moulded.

Checking the borders of an impression tray on the lower jaw by means of functional tests.— The tray is placed on the lower jaw and its borders are checked by active movements of muscles attached to the mandible and by movements of the tongue. It should not be displaced during swallowing, opening of the mouth, and licking the upper lip, when the tongue rests against the cheeks, when an attempt is made to reach the tip of the nose with the tongue or during sucking movements of the lips. If the tray is displaced its edges are shortened at the respective sites.

Displacement of the impression tray on opening the mouth is attributed to the action of the buccinator and chin muscles. The fault is corrected by shortening the tray along its external edge Fig. 1, *a*).



On swallowing the tray is pushed off the jaw by tension of the oropharyngeal ring. To prevent this the distal edge of the tray should be shortened (Fig. 1, *b*).

When the tongue licks the upper lip it moves forward, upward, and sideways and alternately stretches the right or left mylohyoid muscle. If the tray at the sites of these muscles is too long it should be shortened (Fig. 1, *c*).

If the tray overextends at the sites shown in Fig. 1 (*d*), it will be displaced from the jaw when the tongue rests alternately against the right and left cheek owing to tension of the muscles forming the floor of the mouth and the tongue. It is shortened-at the sites indicated. The need to shorten the right side of the tray is determined by pushing the

tongue against the left cheek, and vice versa, the left side is shortened if the tray is raised by pushing the tongue against the right cheek.

Overextension at the site of attachment of the genioglossus muscles and the lingual frenulum to the jaw will lead to displacement of the tray when an attempt is made to reach the tip of the nose with the tip of the tongue. The fault is corrected by shortening the tray at the site shown in Fig. 1, *e*.

When the lips are stretched out for sucking the tray will be displaced if its edge is too long at the site of attachment of the chin muscles; it should be shortened as shown in Fig. 1 (*f*).

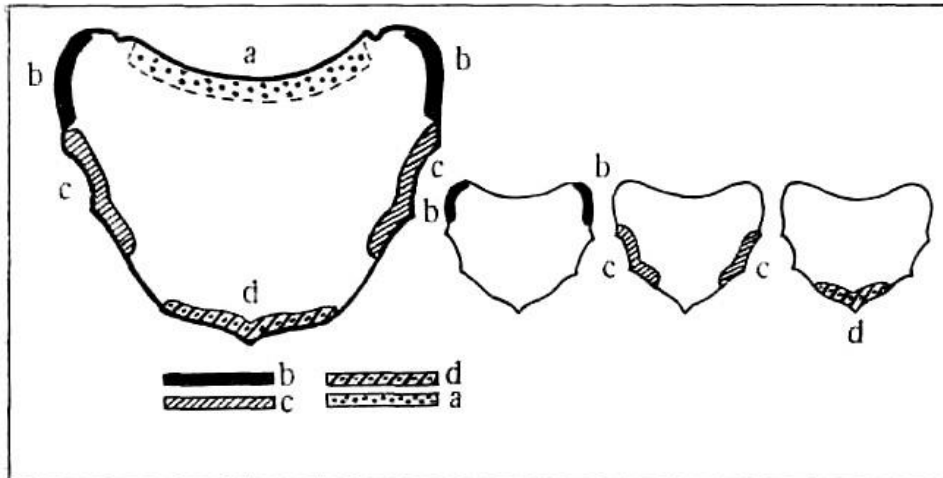
Additional moulding of the impression tray on the lower jaw and impression taking.—The edge of the tray is additionally moulded in the region of the anterior teeth and premolars on the oral aspect (Fig. 2), where the supporting area for the denture is greater and a good valve is formed by the soft tissues. For this purpose the tray with thermoplastic material attached to it is seated on the jaw and the patient is asked to push his tongue first against the right cheek and then against the left two or three times, and then to touch the tray support with the tip of the tongue.

Impression taking.—A thin layer of special thermoplastic material of the type of 'Adgesal' which softens due to the temperature of the mouth is applied to the finally prepared tray; the tray is then seated on the jaw and held pressed with the fingers for 30 to 40 seconds. Then the patient is asked to make the following movements: to swallow, to open his mouth as wide as possible, to lick the upper lip, to push his tongue alternately against the right and left cheek, to make an attempt to touch the tip of the nose with the tongue, and to make sucking movements. Each movement should be repeated for half to one minute. After this the impression is cooled with cold water and quickly and carefully removed from the mouth while the lower lip is pulled downward. It should be kept in cold water till the model is cast; casting is done by the routine method. When the plaster hardens the model is first immersed in cold water for a few minutes and then in hot, after which the tray is separated and the remainder of the impression material is washed away with boiling water. The model is used further for construction of the denture.

Checking the borders of an impression tray on an upper jaw by means of functional tests, additional moulding of the tray, and impression taking.—The impression tray should extend to the vault of the mucosal transitional fold on the vestibular aspect of the upper jaw; its posterior border should extend two millimetres distally to the palatine pits. Swallowing should not cause its displacement. In case of displacement the tray is shortened (Fig. 2, *a*).

A tray that is too long will be displaced from the jaw when the mouth is opened (Fig. 2, a). The same will occur if its edge overlaps the buccal folds. The sites that need to be corrected are shown in Fig. 2 (b).

Displacement of the tray when the lips are drawn out and the* cheeks are simultaneously drawn in indicates its vestibular overextension in the region of the anterior teeth (Fig. 2, c, d).



The impression tray is additionally moulded to cause compression of tissues which contribute to the formation of a valve at the junction of the hard and soft palate. For this purpose a layer of thermoplastic material four to five millimetres wide and two or three millimetres thick is applied to the palatine edge of the tray, and then the tray is seated on the jaw and pressed to it. When the material sets the tray is removed from the mouth. To take the impression a layer of thermoplastic material which softens in the mouth is put on the tray, the last named is seated on the jaw, and the valve edge of the impression is moulded by repeating all the movements described above.

Full upper and lower dentures constructed by the method discussed above should not be displaced by any of the movements like those performed when the edges of the impression were moulded. When new plastic materials became available we suggested a method which permits final shaping of the base with the denture placed on the jaw.

There are three principal approaches to impression taking: the mucostatic, mucocompressive, and the selective mucocompressive techniques.

The Mucostatic Impression Technique

The objective of this technique is to obtain an impression of the tissues in their resting state. The dentist uses a less viscous impression material with minimal application of pressure on the impression tray. Plaster of Paris or alginate are the impression materials of choice. The denture then fits accurately on the tissues at rest, a situation that prevails for most of the time that the patient is wearing the denture. During mastication, the

denture will tend to rotate on the most incompressible areas, e.g. torus palatums, and may lose retention. The adverse effects can be reduced by placing tin foil (of about 0.5 mm thickness) on those areas of the cast where incompressible tissue is present prior to processing the denture.

The Mucocompressive Impression Technique

With mucocompression, the denture-bearing tissues are compressed during impression taking and will be subsequently compressed during denture wearing. Because of the viscoelasticity of the oral soft tissues they will remain compressed for many hours after function. When the denture is processed, it will therefore be maximally retentive during function when the fitting surface has its closest contact with the tissues. The denture will have reduced retention when it is not under load, e.g. when the patient is at rest or speaking. Pressure can be manually applied to the oral tissues using a high-viscosity impression material, e.g. impression compound or by using a close-fitting tray. Alternatively, the denture bearing tissues can be compressed using a closed-mouth impression technique. With this method, load is applied to the tissues using wax record rims with acrylic baseplates, instead of using impression trays. Zinc oxide/eugenol paste is applied to the fitting surface of the rims and the patient applies occlusal load.

Several problems can occur with this technique. If the occlusal pressure is excessive, then the fitting surface of the baseplate may be visible through the impression over a large area. Occlusal load will be concentrated in these areas. Secondly, the occlusion must be even, otherwise excessive mucosal displacement may occur unilaterally.

The Selective Mucocompressive Impression Technique

In this technique, only selected areas of the tissues are subjected to compressive forces. The technique is described later.

The Impression in the Maxillary Region

When taking maxillary impressions, the dentist stands behind and slightly to one side of the patient who should be positioned so that the maxilla is level with the dentist's elbow. In this position, the dentist can firmly control the impression tray and locate it centrally in the patient's mouth with the handle in line with the patient's nose.

The Primary Compound Impression

An upper edentulous stock tray is chosen which is a loose fit, but covers the available denture-bearing area. Disposable plastic trays are commonly available for complete denture construction but they rarely accurately fit the ridge. A primary impression has to be taken so that a special tray can be constructed to take an accurate final impression. Low fusing impression compound can be used to construct the primary impression because it can be applied to the impression, or removed, until the operator is satisfied with the retention of the impression. Impression compound does not give an accurate impression surface, but it registers the extent of sulcus and denture extension. It

should not be used where the ridge is displaceable; in these circumstances, fluid alginate or plaster of Paris are preferable alternative primary impression materials.

Impression compound is heated to 60°C in a water bath and applied to the dry impression tray. Shaping the compound to the approximate shape of the tissues prior to inserting the tray in the mouth assists in locating the tray accurately. The surface of the material is flamed and tempered in hot water. The loaded tray is then inserted and positioned to cover the maxillary tuberosities and pterygoid hamulus regions and the front of the tray is raised with the excess material extruding into the sulcus. The upper lip is elevated and then released to cover the compound, and border moulding carried out. This is where the fingers and thumb manipulate the lips and cheeks to simulate functional movements. An index finger may be necessary to mould the compound into the distobuccal region of the sulcus, with the patient's mouth half open. When the impression compound has cooled sufficiently, it is removed from the mouth and examined. Impression compound is a viscous material and will readily distend the sulcus, so the impression should be adjusted with a wax knife so that it is only minimally overextended. Frenal attachments should be clearly visible. The periphery of the impression can then be warmed, and placed back in the mouth for repeat border moulding. The anterior flange should be no more than 3 mm in width, and rounded in contour.

The posterior flange is warmed, tempered in hot water and placed in the patient's mouth. The patient, moving the mandible from side to side, moulds the distobuccal region of the upper impression with the coronoid process. The patient should also open and close the mouth to allow the medial pterygoid muscle to mould the compound. Where the force required to displace the impression is minimal, tracing stick compound can be applied to the impression in the region of the postdam. The full width and height of the sulcus is marked with a wax pencil on the impression periphery. The impression is disinfected and poured in plaster.

The set cast can be removed from the compound impression by soaking in water at 60°C for 5 min. The tray and compound are then peeled away from the primary cast.

The Secondary Alginate Maxillary Impression

A special tray is constructed on the primary cast from light-cured acrylic resin. Trays made from this material are strong, but brittle, and break easily if dropped. However, they are quickly and easily constructed. They should be 3 mm spaced, and cover the available denture bearing area. The upper tray should extend up to a line between the hamular notches. Alginate does tend to displace the vestibular tissues, especially if of a viscous consistency. Therefore, the periphery of the special tray should be finished 2-3 mm short of the anticipated border of the denture to allow functional movements of the peripheral tissues and correct border moulding of the alginate. The tray extension should be checked carefully on the cast, and areas of overextension reduced.

A central, vertical stub handle should support the upper lip. Therefore the handle of the special tray should occupy the position occupied by the upper natural incisor teeth. Stepped handles should be avoided as they can interfere with the upper lip when border moulding.

The tray is disinfected, and then washed under running tap water. Anterior wax stops are attached to the tray in the premolar region on both sides. Overextended areas where the tray, for example, impinges on frenal attachments should be relieved generously. Posteriorly, tracing stick compound is applied to the special tray to cover the vibrating line (the junction between the mobile and immobile parts of the palate), hamular notches and buccal to the tuberosity regions. Other areas of underextension can be corrected by adding tracing stick compound to the tray. The tray is frequently underextended lateral to the tuberosity. The retention of the tray can be assessed, and if satisfactory, the tissues, especially if of a viscous consistency. Therefore, the periphery of the special tray should be finished 2-3 mm short of the anticipated border of the denture to allow functional movements of the peripheral tissues and correct border moulding of the alginate. The tray extension should be checked carefully on the cast, and areas of overextension reduced.

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The mixed alginate is applied to the tray, which is rotated into place. The back edge of the impression is located first and then the front of the impression positioned. With the patient's mouth half-open, the tray can be located more easily and the lips and cheeks are in a more relaxed position to take part in border moulding. The excess alginate flows forward into the labial sulcus. One hand stabilizes the tray, while the other carries out border moulding procedures. When the alginate has set, the impression is removed by

lifting the cheeks on one side and simultaneously rotating the tray away from the tissues. The patient is instructed to rinse the mouth. The impression is examined to ensure that the anatomical features have been recorded.

The alginate impression is rinsed in water and disinfected. The impression is wrapped in damp muslin and stored in a sealed bag for transport to the laboratory. The instructions to the laboratory should request the impressions be cast in dental stone, and wax occlusal rims constructed with either a shellac or light-cured acrylic baseplate.

The Mandibular Impression

For the lower impression, the dentist should stand in front and to one side of the patient with the patient's mandible level with the dentist's upper arm.

The Lower Compound Primary Impression

Using a stock tray and impression compound or alginate, an overextended impression of the lower ridge is often produced. With severe mandibular ridge resorption, the genial tubercles remain prominent because of the attachment of the genioglossus muscle. Often in these cases, the tray rocks about the central bony prominence. Impression compound has the advantage that it can be extended into the distolingual area more easily, and is therefore the material of choice. Retromylohyoid extension is important in the stability of the lower denture, but can be difficult for patients to tolerate.

A slightly oversized stock tray is chosen to ensure that the residual ridges and retromolar pad are covered. Softened impression compound is applied to the stock tray and, after flaming and tempering in hot water, the compound is inserted in the patient's mouth. The tray is rotated into position and placed vertically onto the residual ridge. The cheeks may have to be gently pulled outwards to avoid them being trapped by the compound. The patient is instructed to raise the tongue to the upper lip as the tray is pressed gently onto the ridges. The forefingers support the tray in place, while the thumbs rest under the lower border of the mandible to provide support. The tongue carries out border moulding lingually by wiping the upper lip and extending alternately into each cheek. Border moulding is carried out labially and buccally by gentle manipulation of the cheeks with one hand, while the other hand stabilizes the position of the tray. The compound impression is removed from the patient's mouth when it has cooled sufficiently. The impression is examined to ensure that frenae, sulcus, retromolar pads, mylohyoid ridges and residual ridges are accurately recorded. Areas of gross overextension are removed and the impression is flamed, tempered and reapplied into the patient's mouth, where border moulding is repeated.

Where resorption has been particularly severe, the residual ridge blends imperceptibly into the sulcular tissues. With severe ridge resorption anteriorly, the labial sulcus can sometimes seem difficult to identify as it merges into the mentalis muscle. This can make construction of the special tray difficult, as the correct peripheral extension

can be indefinable. A thin wash of zinc oxide/eugenol paste applied to the primary compound impression can outline the sulcus by providing more surface detail. Alternatively, a fluid mix of alginate can be used.

The Lower Special Tray Impression Using Zinc Oxide/Eugenol Paste

The primary impression is cast in plaster and a lower close-fitting special tray constructed in light-cured dimethacrylate resin. A vertical stub handle is positioned centrally, to locate the tray and remove it following completion of the impression-taking procedure. Additional stub handles can be included in the premolar region of the tray, to be used as finger rests while the impression material sets. The lower special tray is underextended by 3 mm so that a sufficient quantity of tracing stick compound can be applied to the periphery of the tray and adapted to the functional shape of the sulcus. However, before adding the compound, the extension of the tray in the mouth is checked by manipulating the lips and cheeks and any overextension removed. The patient protrudes the tongue to touch the upper lip and if the tray is displaced, the distolingual region of the tray in the retromylohyoid space is reduced. Any other areas of overextension are removed and the borders are smoothed.

Tracing stick compound is heated and applied to the tray periphery. The compound is tempered in hot water, placed in the mouth and border-moulded with functional movements of the patient's lips and cheeks. The peripheral border extension of the lower tray is modified with tracing stick compound. The lower tray is designed to support the lips and cheeks in the same way as the completed denture. This is accomplished by adding tracing stick compound to the labial and buccal surface of the tray to record the full width of the sulcus. The buccinator muscle attaches to the external oblique ridge of the mandible and limits the extension of the impression in this region.

The most difficult region to record accurately, the lingual extension, is modified in thirds. Tracing stick compound is applied to the retromylohyoid area on the right side, the left side and finally the anterior lingual region. Each time the compound is moulded by the action of the tongue, which wipes the upper lip. Impression compound is added to the tray labially and buccally, and is moulded by the cheeks and lips. The correct amount of directed movement of the tissues to obtain a peripheral seal can be difficult to determine.

The tray covers the retromolar pad and extends into the retromylohyoid space, where its posterolingual extension is limited by the palatoglossal muscle. This muscle forms the anterior pillar of the fauces. The floor of the mouth moves upward during function due to contraction of the mylohyoid muscle, therefore the lingual border has a resting and active level. The lingual border extension of the lower tray can be checked functionally by adding increments of impression compound, and visually by ensuring the tray periphery extends towards the base of the tongue. When the patient relaxes the tongue, it remains in light contact with the periphery of the tray and is retentive. However,

if the tongue is retracted habitually to guard the pharynx, then in this position the tray is unretentive.

Petrolatum (Vaseline) is applied to the patient's lips to allow easy removal of the zinc oxide paste. Having dried the tray, a thin layer of zinc oxide/eugenol paste is added. Care should be taken to cover the entire periphery with paste prior to insertion of the tray in the patient's mouth to ensure sufficient material on all borders. The tray and impression material are inserted, and the lips and cheeks manipulated to mould the peripheral border of the impression. The forefingers rest on the vertical stub handles to prevent distortion of the impression, and the thumbs are placed under the lower border of the mandible to provide support. Correctly extending the impression in the distolingual area is necessary for good denture retention.

Selective-pressure Impression for the Lower Ridge

Gentle palpation of the crest of the residual ridge can sometimes elicit pain due to an irregular shape to the underlying bone. The crest of the residual ridge undergoes continuous resorption and histologically can resemble a coarse cancellous bone. Often a mobile fibrous remnant is present over the crest of the residual ridge. The tissues lateral to the crest of the ridge and in the sulcus may be better able to tolerate applied occlusal load. The selective pressure impression technique records loading of the peripheral tissues.

An alginate impression of the lower jaw is taken in an edentulous stock tray, modified to be fully extended. A fluid mix of alginate avoids tissue distortion. This impression is cast in laboratory plaster, and a 3-mm spaced special tray is constructed in light-cured acrylic, as previously described. An impression of the cast is now taken using impression compound in the special tray to produce a layer about 3 mm thick. On removal from the cast, the periphery of the compound is heated and the border moulded in the patient's mouth. The impression compound in the centre of the tray over the crest of the ridge is removed and the tray perforated in this region. The tray is washed and dried. Zinc oxide/eugenol is applied over the whole fitting surface of the tray, which is inserted into the patient's mouth. Zinc oxide/eugenol exudes from the holes on the top of the tray, thus applying reduced pressure in this area. It may not be possible to incorporate stub handles on the ridge crest of the tray as they may interfere with the provision of the perforations. The border-moulding procedures are carried out and when the zinc oxide/eugenol impression material has set, the impression is removed from the mouth and disinfected. It is cast in dental stone.

During mastication, with lower dentures constructed using the selective pressure impression technique, occlusal load is greater over the peripheral tissues and less over the crest of the ridge.

The Upper Selective-pressure Impression Technique

This impression technique is used when the upper ridge is flabby in one area, usually the anterior region, but firm elsewhere. A fluid alginate impression is taken of the tissues and a plaster cast produced. A 2-mm spaced special tray is constructed on the cast, and made 3 mm underextended from the sulcus. The tray is used to obtain a compound impression of the plaster cast, but the cast must be soaked in cold water for 5 min so that the compound can be removed easily from the cast. The periphery of the cast is border-moulded in the mouth to correct the peripheral extension. The compound covering the firm area of the palate is flamed and tempered in hot water, and then reinserted into the patient's mouth. The firm tissue is compressed and the flabby tissue remains undistorted, providing maximum support for the denture during function. To improve the surface detail, the compound is coated with a thin layer of zinc oxide/eugenol impression paste and inserted in the patient's mouth. Border moulding is carried out, and when the paste has set, the impression is removed from the patient's mouth.

Selective pressure impressions should be cast up in dental stone and clear heat-cured acrylic baseplates constructed. Wax record rims are built on the baseplate. Any blanching of the underlying tissues can be observed clinically, and the baseplates adjusted if necessary. Unfortunately, if utilized in the final denture construction, these acrylic bases undergo warping as stresses are released during further polymerization of the dentures.

Laboratory method of individual tray making.

WINDOW TECHNIQUE

A primary impression is taken in alginate loaded in a stock tray. The impression is then poured and a special tray is constructed on the model. The special tray is close fitting and has a hole or "window" over the area corresponding to the flabby ridge. An impression is taken in impression paste (mucodisplacive). Once this has set it is left in place and impression plaster (mucostatic) is painted over the flabby ridge and allowed to be set and removed as one impression. The impression is removed as one, cast and the denture constructed on the resulting model.

SELECTIVE DISPLACIVE TECHNIQUE

This technique aims to displace but not distort the flabby ridge as if in function. A primary impression is taken in a mucostatic impression material (e.g. impression plaster or alginate) and cast in stone. A spaced special tray for an impression compound impression is then constructed on this model. The tray is loaded with compound and an impression taken of the model of the patient's mouth. This reduces the risk of displacing the flabby ridge. The tray is then warmed and placed in the patient's mouth. It is adapted and border moulded to the tissues, and should be quite retentive. The impression is removed and warmed all over apart

from the flabby ridge area. The impression is retaken, the flabby ridge is compressed but not distorted as the other portions of the impression compound sink into the tissues. The impression is removed inspected and retried in the mouth to check that it is stable. If any instability occurs then the impression should be reheated and re-taken. A wash impression may be taken in impression paste to obtain maximum detailed retention and stability.



1) *The flabby ridge has been marked on this patient*



2) *The preliminary cast and a spaced special tray*



3) *Impression of the cast being taken in impression compound prior to being placed in the mouth*



4) *Flabby ridge impression after flaming and placing into the patient's mouth*

The treatment of flabby ridges is controversial and no treatment is preferred, so it is often the method favoured by the clinician to be used.

Clinical method of individual tray making.

For this method we need thermoplastic materials – doubled wax plates (or plate of Sten's mass).

1) First step – to cut a doubled wax plate by the upper or lower jaw form.

2) To warm up it on a spirit lamp, a gas burner or in hot water and place in patients oral cavity on alveolar ridge.

- 3) Next step – for forming of tray rims, warm up one side (left or right),
- 4) Insert in the mouth,
- 5) Press the tray rims from vestibular side and abduct cheek ahead and down (soft tissues make imprint of neutral zone on the wax surface).
- 6) The tray is removed from the mouth and cooled in cold water,
- 7) Cut places that contact plica buccalis, frenulum lingualis, frenulum labii.
- 8) Repeat the same procedure on another row.

The tray is reinforced with a one-millimeter thick wire applied along the projection of the apex of the alveolar process. In this form it is ready to be tried on in the mouth to be corrected so that its rims lie strictly within the valve zone.

By CITO modification vestibular rims of the tray overlap alveolar ridge on 3-4 mm and conclude on neutral zone. Distal rim conclude on A-line.

Vasilenko has some changes in individual tray fabrication:

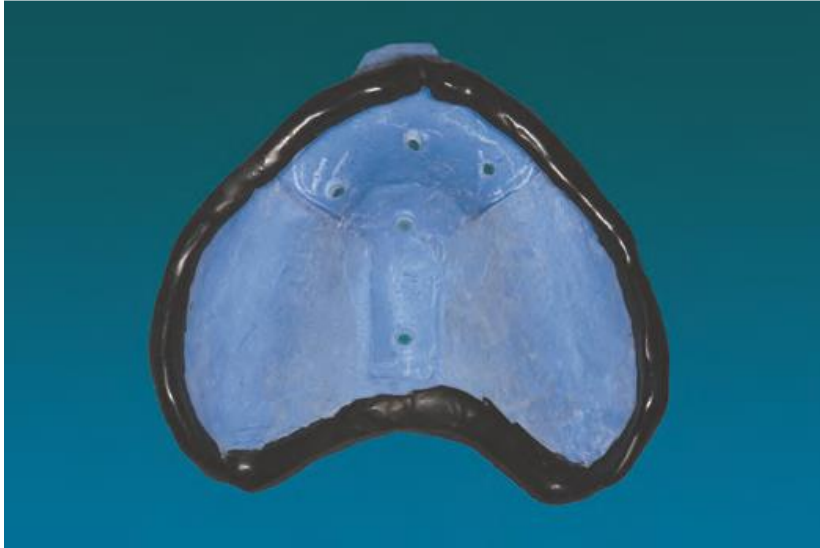
- Vestibular rims are shorter and overlap alveolar ridge on 2-3 mm
- Distal rim is longer (prior to 4 mm)
- Edge of tray is with 45°
- In torus zone there are 2 perforations upon suture of the hard palate

A correctly adjusted tray becomes attached to the mucosa by suction and it is not displaced by movements of the lips, cheeks and tongue. After it has been correctly adjusted, the tray is removed from the mouth, loaded with impression material (stone) and again inserted into the mouth and placed on the jaw. Rims are formed with functional tests.

Preparing the Tray for the Impression

Any “relief wax” is removed from the tray. For the selective pressure technique, this creates a void or chamber between the nonprimary stress-bearing tissues of the arches and impression trays. This chamber minimizes the possibility of physical pressure from the tray to the tissues during the impression-making procedure. Any sharp ridges at the resin/wax interface are smoothed with an acrylic bur. Additionally, approximately five #8 round bur sized holes are cut through the tray in the chamber areas (Figure 7–18). These holes allow the relief of hydraulic pressures that will build because of the viscous impression material being squeezed between the tissues and the impression tray. No relief of the border molding material is normally required because most impression materials will be minimally viscous

and therefore no extra space is required for the material. If a viscous impression material is selected, then approximately 0.5 millimeter of the border molding material should be removed. Adhesive specific to the particular impression material being used is applied to the entire tissue side of the tray and extends onto the labial and buccal surfaces approximately 4 mm. All impression compound border molding material should be coated with the adhesive.



The relief wax has been removed from the impression tray creating a relief chamber in the area. All sharp edges have been rounded, and five relief holes have been prepared using a #8 round bur.

Making the Final Impression

The final impression is made using the desired impression material. Some of the characteristics

of an ideal material include being minimally viscous, polymerizing (setting) intraorally within 2–3 minutes, being hydrophilic, being thixotropic, not flowing once removed from the mouth, not being excessively rigid, not being excessively expensive, being well tolerated by the tissues, being exacting in recording and maintaining tissue details, and the ability to be poured in a dental stone more than once. The selected impression material is mixed according to the manufacturer's directions and applied evenly to the tray to a thickness of approximately 3 mm, being careful

to avoid capturing air bubbles within the material. Only this minimal thickness of impression material is needed because a custom impression tray, rather than a stock tray, is being used and was fabricated to closely fit the underlying tissues. Because most impression materials are hydrophobic, while the impression tray is being loaded, the tissues to be captured in the impression should be freed of moisture. The patient should swallow all excess saliva, and the tissues should be carefully dried with 2 x 2 sponge gauze. When inserting the impression tray, the clinician must

carefully observe the seating of the tray onto the tissues. Before completely seating the impression, the clinician must properly position the impression tray over the ridge so that the anterior flange of the tray will seat properly and completely into the labial vestibule. When seating the mandibular impression tray, the clinician must take special care to not capture any fatty roll of tissue. Probably the most critical of the retention factors listed earlier is that of atmospheric pressure. When the pressure of the air between the denture base and the underlying tissues is less than that of the atmospheric air pressure, excellent retention of the denture is expected, and patients often refer to this retention as suction. This retention is lost, most noticeably from the maxillary arch, if the denture/tissue contact (seal) around the denture borders has been lost and air is freely allowed between the denture and the underlying tissues. A loss of this seal is often caused by resin shrinkage during polymerization. Acrylic resin shrinks toward the area of greatest bulk of the denture, which is generally around the denture teeth. On the maxillary arch, this shrinkage usually results in the creation of a good seal around the labial and buccal sides of the denture and loss of seal at distal extent of the denture as it crosses the palate. In this area, as the resin shrinks toward the denture teeth, it tends to lift away from the cast resulting in a future loss of the seal and hence loss of denture retention. This shrinkage must be anticipated and steps taken to help ensure that resin/tissue contact will exist following processing. Some newer injection molding techniques minimize this problem. Be sure to check with the material manufacturer regarding recommendations concerning palatal seal areas.

This technique is called the placement of a posterior palatal seal within the denture. The procedure consists of an initial identification of compressible tissue in the posterior of the hard palate and the determination of the depth to which this tissue could be comfortably compressed by the denture base. The posterior limit of the posterior palatal seal area is the vibrating line, which extends from just buccal (2 mm) to one hamular notch area across the palate to just buccal to the opposite hamular notch. At the vibrating line, the tissue in the posterior palatal seal area can be compressed approximately 0.5 mm deep in the hamular notches and midline areas and

1 mm deep in other areas however the exact depth for a specific patient is determined by palpation. Intraoral identification of this area is eventually followed by a laboratory procedure, which consists of the removal of an area of stone from the master cast that corresponds to the amount of displaceable tissue palpated intraorally. The depth of stone to be removed from the cast is generally deepest toward the vibrating line and feathers to an indistinct anterior border.

When acceptable, the impression should be disinfected, prior to removing it from the operatory, and the posterior palatal seal area should be drawn on the impression

with an indelible pencil, It can then be taken to the laboratory, beaded, boxed, and poured using an ADA-approved dental cast stone of choice following manufacturer's directions.

VI. PLAN AND ORGANIZING STRUCTURE OF THE LESSON

№	The main stages of the lesson	Education aims	methods of control	Materials for methodical supply	Duration
1	2	3	4	5	6
	I. Initial stage.				30 min.
1	Lesson's organization scheme				3 min.
2	Formulating of educational aims and motivation			According to chapter II and III	2 min
3	Control preliminary level	IInd level	Theoretical express questioning.	Test questions of 1st Level	5 min
	1. Topographic and anatomical peculiarities of complete edentulous	IInd level	Test control of preliminary level.	Test questions 2nd level.	3 min
	2. The contemporary methods of fabrication of individual tray.	IInd level		Models, tables, pictures, casts, video movies.	5 min
	Diagnostics.	Ist I level	Writing up questions.	Flask; pictures; video movies;	3 min

Continue table

1	2	3	4	5	6
	3. Structure of the soft cover of the hard palate.	IInd level	Solving typical tasks.		5 min
	4. Fabrication of individual tray in the laboratory			Models, tables, pictures, casts, video movies; wax.	5 min
	5. Mistakes and complications during of individual tray fabrication	IInd level			4 min
4	II. Main stage.				30 min

	Formation and development of professional skills	IInd level	1. Investigation of models.	Models, patterns, present caseworks, complicated works.	2 min
	1 .To master step by step the algorithm of examination of edentulous patients		2. Analysis of patterns, present caseworks.	instruments and devices, which are used for fabrication	15 min.
	2.To perform classification for edentulous upper and lower jaws.			Instruments and devices, which are used for modelling	13 min
	III. Final stage.				30 min
5	1.Control, correction and improving of professional skills.	IIIrd level	Individual control practical skills and their results.	Analysis of results of X-ray investigating, analysis pattern works and videomovies.	15 min
	2.Summarizing materials of lesson.				10 min.
	3.Tasks for home work:				2 min.
	Training literature for this theme, main and supplementary literature.			Orientation scheme for individual training with literature.	3 min

VII. MATERIALS FOR METHODOICAL LESSON SUPPLY

Questions for the initial control of students` level of knowledge

1. What is a functional impression?
2. What are the methods of individual trays manufacturing?
3. What is the aim of functional tests usage?
4. What are the methods of fitting individual trays on the maxilla and mandible by Herbst?
5. Speak about function of the muscles function.
6. What techniques of functional impression do you know?
7. What method is the most frequently used? Why?
8. Enumerate the clinical phases of impression taking
9. What materials do the dentists use for functional impression?

VIII. Materials for the methodical supply of the individual students' self-preparation:

Sequence of stages	Methods of performing.
1. Examination of the patient.	To perform stages of subjective and objective patients examination.
2. The carry out the examination and treatment of edentulous patient.	To place patient in optimum position in dental chair. The individual tray must cover all edentulous alveolar ridges, palatinum.
3. To know the requirements to individual trays.	The mandibular tray should cover the retromolar pads and the entire alveolar ridge, and the maxillary tray should cover the pterygo-maxillary notches and the vibrating line of the soft palate, while extending comfortably into the facial and lingual vestibules. The alveolar ridges must be located at the middle of the tray.

The tests for topic

Adjusting the borders of an individual impression trays Functional impressions taking from upper and lower jaws.

1. What material a dental plaster is?

- A. Elastic
- B. Termoplastic
- C. Crystallize
- D. Polimer
- E. Polyether

2. The functional impression is:

- A. The impression taken with individual tray what image mucosa surface and functional condition of prosthetic bad tissues
- B. The impression taken with stock tray during the oral tissues functioning
- C. The impression taken with adapted stock tray for edentulous jaw during the oral tissues functioning
- D. The impression taken with stock tray during the chewing, swallowing and other functional tests
- E. The impression taken with individual tray during the functional rest

3. What material an alginate mass is?

- A. Elastic
- B. Termoplastic
- C. Crystallize
- D. Polimer
- E. Polyether

4. What kind of impression tray should be taken for an anatomical impression from edentulous jaw?

- A. Stock plastic not perforated
- B. Stock metal perforated
- C. Metal not perforated
- D. Individual impression tray
- E. Partial plastic tray

5. What is the A-line?

- A. Imagine line between hard and soft palate
- B. Internal oblique line
- C. Transition place of not-movable to movable mucosa
- D. Place of connection of mucous to teeth enamel
- E. Imagine line between first incisors and last molars on lower jaw

6. The 53 years old male patient complaints on absence of teeth on lower jaw. Objectively: full secondary edentulous lower jaw, severe even atrophy of alveolar bone, place of mucous folds and muscle attaching located at the base of the collar. What type of alveolar bone atrophy by the Keller classification in this case?

- A 2nd type
- B 1st type
- C 3rd type
- D 4th type
- E 5th type

7. Patient D., 65 years old with an edentulous upper jaw appealed to the dental office for the prosthetic rehabilitation. Clinical examination revealed that the visibility of alveolar bone is created by moving the mucous alveolar ridge. Alveolar bone is extremely atrophied. What kind of impression should be preferred in this case?

A Decompressive

B Compressive

C Differentiative

D Anatomical

E Anatomical with chewing pressure

8. The 54 years old patient was made anatomical impressions for complete removable dentures fabrication with alginate material. For how long time a plaster model should be done?

A 1-10 min.

B 30-45 min.

C 15-20 min.

D 60 min.

E 20-30 min.

9. Patient P., 72 years old, complains on complete inability to use complete removable denture for the lower jaw. This denture was made a month ago. OBJECTIVE: on the alveolar ridge sharp crest bone was palpated, oblique internal line expressed. What is the treatment plan?

A To fabricate new complete denture with colourless acrylic

B To fabricate new complete denture with metal base

C To fabricate new complete denture with expressed borders

D To fabricate new complete denture with soft elastic layer

E To fabricate new complete denture with shortened borders

10. Patient B., 76 years old with a complete absence of teeth on upper jaw is planned to make complete removal denture. What material for anatomical impression should use?

A Ypeen

B Sinma-M

C Zeta Flow

D Stomaflex

E Express VPS