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Dental Assistant Journeyman

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STUDIES show that many people are unhappy about the about the appearance of their smile. Twenty-five percent of Americans say their smiles and/or teeth are the facial features they would change to boost their self-esteem. Prosthodontists are the experts in improving appearances by restoring broken, discolored, malpositioned and/or misshapen teeth. A better smile and improved oral function can greatly improve a person's self-image. Functional teeth help to maintain general health and well being. Proper chewing of food is essential, especially as you grow older. The inability to properly and thoroughly chew food may result in poor nutrition, gastrointestinal disorders, health compromises, and diminished quality of life. Most prosthodontic treatment is concerned with replacing missing teeth. The appliances replacing the missing teeth are either fixed or removable.

2-1. Fixed Prosthetic Procedures

A fixed prosthetic procedure is also known as a “crown and bridge.” These specialized procedures belong to an area of dentistry involved with the replacement of missing teeth with gold or porcelain fixed prosthesis. These prosthetics are cemented in place and cannot be removed by the patient. The prostheses are fabricated in the dental laboratory from impressions taken in the treatment rooms. These include full crowns, partial crowns, inlays, onlays, bridges (fixed partial dentures) and veneers.

411. Evaluation, preliminary impressions, preparation and final impressions procedures

The fabrication and insertion of fixed prosthetics are carried out in sequential steps. The chairside procedures for crowns and fixed partial dentures are similar and are usually completed in three appointments. We'll cover the procedures normally performed during each of these appointments.

Evaluation procedures for preliminary impressions

At the initial appointment, the dentist will conduct a prosthodontic evaluation of the patient's treatment needs. After the dentist completes the evaluation, preliminary maxillary and mandibular impressions are made for the fabrication of study or diagnostic casts. Some dentists prefer to make preliminary impressions themselves, while others will delegate the task to their dental assistants.

Before the preliminary impressions are made, complete a DD Form 2322. You need to complete as much of the form as possible before the appointment. When the dentist completes the evaluation, complete the rest of the form with information such as the specific type of prosthesis or restoration to be made. As the assistant, it's your responsibility to coordinate the prosthodontic cases with the dental laboratory. You'll need to request and coordinate the fabrication of items needed to perform chairside procedures involved in fabricating the prosthesis with the laboratory. For example, be sure to indicate the need for study casts, custom trays, and plastic stints (vacuum-formed templates) used in the construction of a temporary crown or FPD. Request completion of these items on the DD Form 2322, ensuring the items are available and ready for use before the date and time of the patient's next scheduled appointment.

After the preliminary impressions are made, clean and disinfect them according to the recommended infection control standards, and then transport the impressions to the dental laboratory along with the DD Form 2322. The dental laboratory technician will:

- Pour diagnostic casts.
- Make a custom tray.
- If needed, use the diagnostic cast to construct a provisional (temporary) fixed restoration.
- Place these items into a metal prosthetic case pan along with the DD Form 2322.

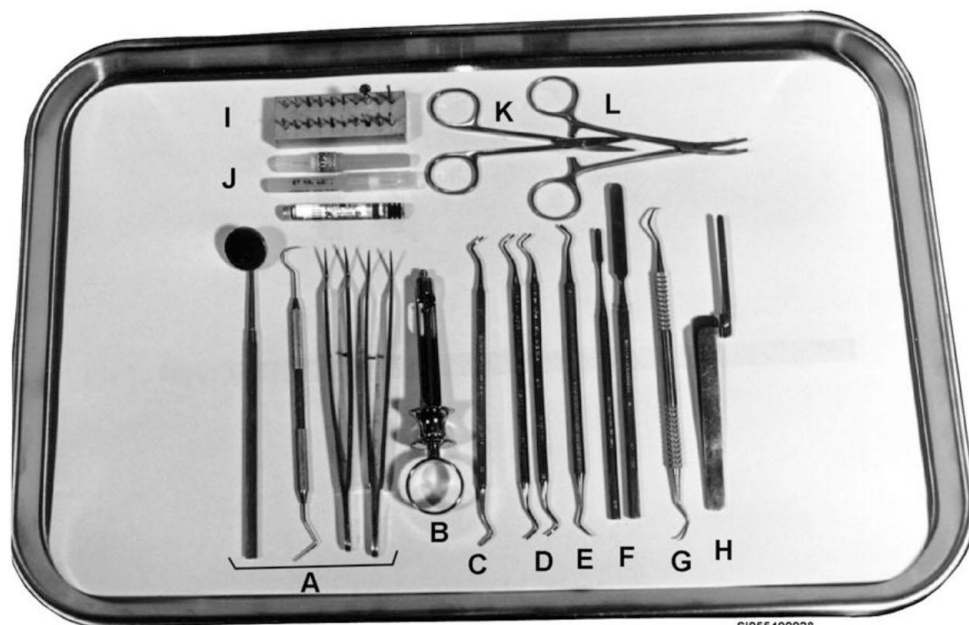
Prior to the patient's next appointment, you'll need to retrieve the case pan and ensure the items requested were fabricated by the laboratory.

Preparation procedures for final impressions

The steps in tooth preparation for crowns and fixed partial dentures are similar. A basic tray setup for fixed prosthetic treatment is shown in figure 2-1. Become thoroughly familiar with each instrument and understand its use.

Unless the tooth was endodontically treated, the dentist will usually administer a local anesthetic. The basic steps involved at this appointment are:

1. Selecting a shade.
2. Preparing the tooth or teeth.
3. Making the final impression.
4. Preparing and cementing the temporary restoration.



- | | | |
|----------------------------------|--------------------------|-----------------------------------|
| A. BDS with extra cotton forceps | E. Stellite | I. Assorted Burs |
| B. Anesthetic Syringe | F. Spatulas, #313 & #324 | J. Anesthetic Needles and Carpule |
| C. Large Spoon | G. Periodontal Curette | K. Scissors |
| D. Paired GMT's | H. Articulating Forceps | L. Curved Hemostat |

Figure 2-1. Basic instrument tray setup for prosthodontic treatment.

Shade selection

Prior to any tooth preparation, its best if the dentist selects a shade for the basic porcelain color or colors for a given tooth. Each manufacturer provides a number of different colors in its porcelain system and a shade guide (fig. 2-2), used in the selection of the basic color. The shade guide must be compatible with the porcelain material used to fabricate the restoration. You can provide invaluable assistance to the dentist in shade determination. Deciding the appropriate shade is difficult even for the most experienced clinician. You need a basic knowledge and understanding of color and how light sources affect colors to provide assistance.



Color is defined by three primary criteria:

1. Hue.
2. Chroma.
3. Value.

The first criterion, known as hue, identifies the color (i.e., red, orange, and blue are all names of colors). The second, known as chroma, describes the strength or color saturation of a hue (color). For example, a red object has a higher chroma than a pale pink object. The third criterion is value, which describes an objects reflectivity or brightness. For example, a white tooth reflects more light than a gray or brown tooth; consequently, the white tooth has a higher value than a gray or brown tooth. Value is probably the most important dimension of shade matching. In addition to the hue, chroma, or value, consider how the surrounding environment influences your perception of color.

NOTE: Without light, color cannot exist. Each light source, whether it is daylight, fluorescent light, or color-corrected light, emits a wavelength of energy containing varying amounts of color. While some light sources are high in blue and green, and low in red, others are just the opposite. While daylight is considered by many to be the best light source for comparing colors, it varies in intensity and quality. The incandescent and fluorescent light sources are too narrow in their energy distribution to serve as really good sources of light. The light that produces consistent illumination and negates using daylight is the color-corrected light. These lights are made to emit a broader spectrum of light for color comparisons.

There are certain things that you can do to enhance your ability to evaluate the color of objects. Develop a habit of viewing the shade selection at various distances—close-up and then far away. Also, if you squint your eyes while viewing, the amount of light coming to the retina decreases and brightness differences will be more apparent.

When assisting in shade selection, make sure the shade is the same brightness so that the restoration will blend with the remaining natural teeth. As a rule, teeth become darker the more posterior they are located. Natural teeth have dominant colors in the yellow-red to yellow-orange range. Decide whether the tooth contains red or orange as part of its dominant color. The tooth may not contain either one, but actually be a neutral color. The dominant color of the restoration also influences the way you correct the color of a restoration.

Select a shade that is higher in brightness since it can be easily stained to a lower value if no satisfactory match is available. It's impossible to stain a tooth to obtain a lighter shade (higher value) without producing opacity.

Preparation

Tooth preparation for a full crown involves the initial preparation and establishing the margin or finish line. The combination of cuts a dentist makes on a natural tooth, for purposes of receiving a restoration, is called a preparation. A fixed prosthetic restoration, such as an onlay or a crown, has to cover all the prepared tooth surfaces. The margin of the preparation also represents the border or margin of a proposed restoration. Depending on the kind of preparation the dentist has made, part or the entire margin could be below gingival tissue. Refer to figure 2-3 as you study the various steps involved in tooth preparation.

A primary purpose of the initial preparation is to remove sufficient tooth structure in order to accommodate an adequate amount of restorative material for strength (fig. 2-3 view A-B). The initial preparation of the tooth is done with a tapered diamond rotary instrument in the ultra-speed handpiece. The handpiece is operated with an air-water spray to keep the tooth debried and dissipate heat generated during the cutting process. It's your responsibility to retract the cheek and lips or tongue, and evacuate debris during the removal of tooth structure. The removal of tooth structure is accomplished most efficiently by reducing the occlusal or incisal surface first in order to decrease the length of the clinical crown. This makes the reduction of the facial, lingual, mesial, and distal surfaces

easier. The gingival extent of this reduction terminates at the free gingival margin. A ledge of a predetermined width (depending on the type of full-crown retainer used, gold or porcelain-fused-to-metal (PFM)) is created at the free gingival margin to serve as a guide for finishing the preparation.

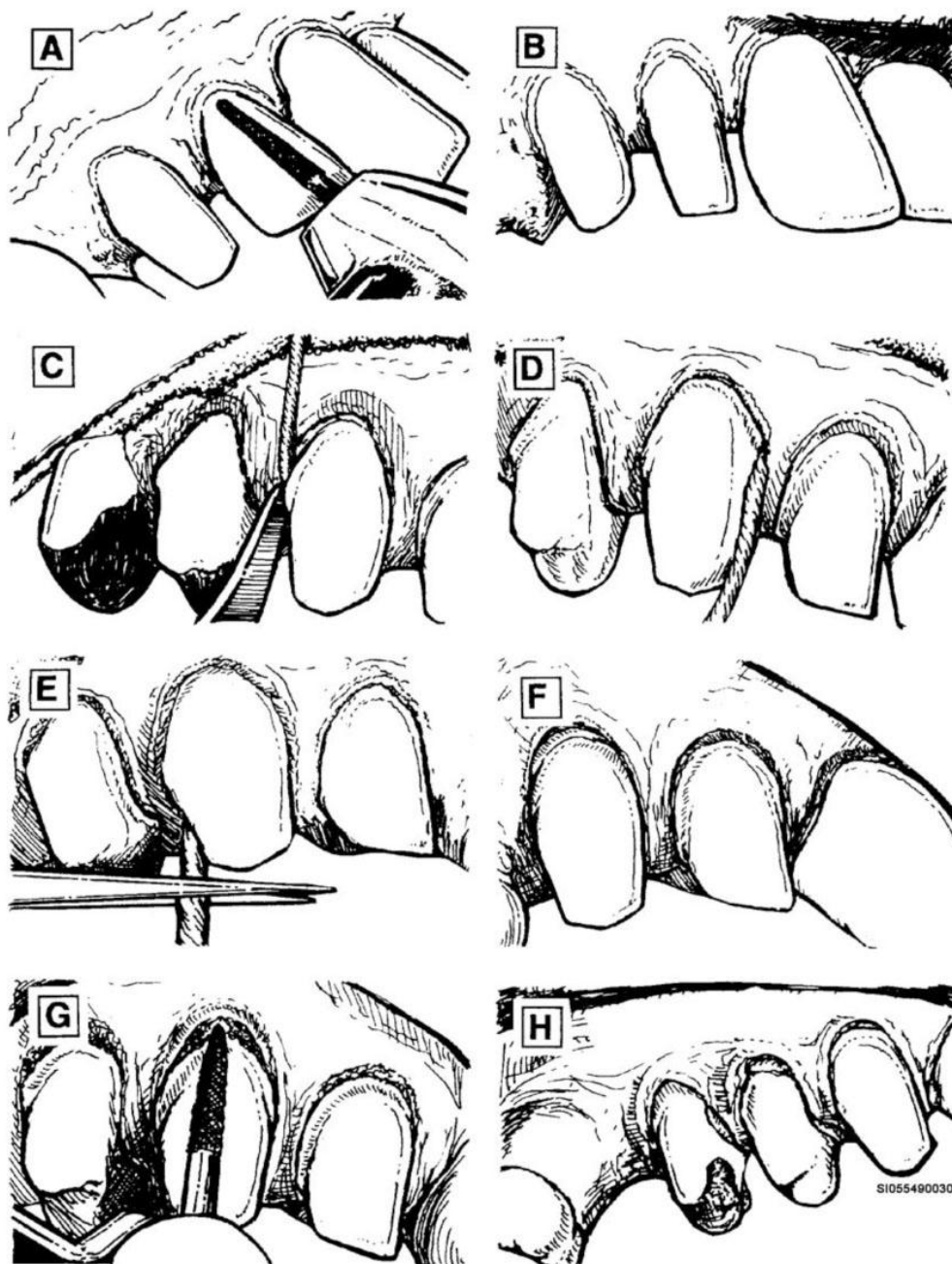


Figure 2-3. Steps in tooth preparation for fixed prosthesis

When creating the margin, which is usually below the free gingival margin, the dentist must be extremely careful not to damage the supporting tissues of the tooth. One method of displacing the free gingival margin from the tooth is the use of gingival retraction cord. Gingival retraction cord is a length of tightly wound cotton cord that can be impregnated with an astringent to control hemorrhage. The cord is placed into the gingival crevice with a flat-bladed instrument. In order to prevent the diamond instrument from grabbing the cord during the finishing procedure and removing it from the gingival crevice, loose ends of the cord must not be exposed. Before the last five to six millimeters

(mm) of the cord is placed into the crevice, remove any excess length so that when finally positioned, the two ends of the cord overlap by approximately one mm (fig 2-3 view C-F). Place clean cotton rolls along the facial of the area being worked to maintain a clean, dry area while the dentist inserts the retraction cord. The dentist then completes the margin preparation with the retraction cord in place (fig. 2-3 view G-F).

Final impression

Of the many impression materials available, polyvinylsiloxane is the most popular for routine fixed prosthodontic procedures due to its elastic properties and versatility in application. The most common method of making final impressions involves the use of a customized acrylic tray for complete arch impressions. The most accurate working casts are developed routinely from impressions using the tray technique with an elastic impression material. Success with the tray technique depends on:

- Proper control of supporting gingival tissue during tooth preparation.
- Adequate isolation and moisture control during the impression procedure.
- Proper handling of the impression material.

As the chair-side assistant, you assume a major role throughout the procedure.

Preparation for the tray impression actually begins during tooth preparation at the stage when the gingival area is isolated with retraction cord. A properly positioned cord serves two functions. First, it displaces the free gingival margin for completing the tooth preparation. Second, it opens the gingival sulcus for the impression. If the cord is removed during development of the margin preparation, the tissue must be repacked for the impression. At this stage, one end of the cord should protrude from the sulcus so it can be easily grasped with cotton forceps for removal just prior to injecting the impression material into the gingival sulcus. Additional preparation of the mouth for the impression includes irrigation, aspiration, and isolation of the preparation site with clean dry cotton rolls. To aid in removing the temporary, lightly coat the preparations with lubricant before inserting the acrylic resin over the teeth.

Before you prepare the impression materials, paint the custom tray with tray adhesive, which is compatible with the impression material. Be sure to accomplish this well enough in advance to allow the adhesive to set. The impression materials selected for use will be auto-cured, or supplied as a two-paste base and catalyst system that is mixed in equal lengths. If you use a two-paste system that requires manually mixing, follow the manufacturer's instructions to mix the material.

Usually, impression material of two different viscosities (bodies), are used. Prepare a regular-bodied material and load it into the custom tray. Also, prepare a light-bodied material and load it into a syringe (if not using the extruder gun). As the retraction cord is removed, the dentist injects the light-bodied material around the sulcus of each individual tooth prepared. During this procedure, assist the dentist with retraction of the lip, cheeks, and/or tongue, and have the impression filled custom tray ready for insertion. Once the dentist seats the tray, place a saliva ejector in the patient's mouth to remove excess saliva while the impression material sets. After the impression material is set, the dentist removes the impression from the patient's mouth. Allow your patients to rinse with water, and provide a hand mirror and tissue or gauze to allow them to clean excess material from their face. Before you take the impression to the laboratory, clean and disinfect it according to current infection control standards. Never transport an impression to the dental laboratory without its corresponding DD Form 2322.

Bite registration and face-bow transfers

The dentist may determine that an accurate bite registration is necessary to establish the proper occlusal relationship when mounting casts. There are numerous ways that a bite registration can be made. Some of the common methods use reinforced bite registration wax or dental stone mixed with slurry water.

When multiple crowns or fixed partial dentures (FPD) are being constructed, the dentist can also decide to make a face-bow transfer. For fixed prosthesis cases, a significant number of maxillary teeth are usually present; therefore, an occlusion rim is rarely used when making a face-bow transfer for these cases. Instead, the dentist covers the face-bow's bitefork with a uniform thickness of record base wax or modeling compound. The dentist warms the material and presses it against the patient's maxillary teeth, picking up a series of incisal edge and occlusal surface indentations. The face-bow transfer is sent to the laboratory where the technician sets the maxillary cast into the indentations when the face-bow is being related to the articulator during cast mounting.

Provisional (temporary) restoration

A provisional restoration is used to stabilize and protect the prepared tooth or teeth while the permanent appliance is fabricated. When there is a problem controlling hemorrhaging at the *preparation* site or if the appointment length is insufficient, the dentist may make the temporary appliance, cement it, and reappoint the patient for the final impression and bite registration.

In order for a provisional crown to successfully fulfill its purpose, it should cover and seal the prepared tooth to prevent penetration of oral fluids and bacteria that can cause the tooth to become hyperemic and sensitive. To prevent tooth sensitivity, the temporary should extend to the margin of the tooth preparation, but not beyond it. A temporary that extends beyond the margin into the gingival tissues can become an irritant to the tissue. The temporary should also:

- Be smooth and polished so it does not irritate the tongue, lips, cheeks, or gingival tissues.
- Provide the appropriate occlusal form and relationship to any opposed teeth.
- Provide appropriate proximal contact relationships with unprepared adjacent teeth to prevent drifting.
- Provide acceptable esthetics whenever a temporary is placed in an anterior area.

Preformed acrylic resin and aluminum shell temporary crowns are commercially available. Their use is limited to the temporary restoration of a single tooth preparation.

There are several methods to fabricate a provisional restoration or FPD directly in a patient's mouth. One method involves making a full-arch alginate impression prior to tooth preparation. The alginate impression serves as a mold for fabrication of a provisional restoration or FPD. After the dentist completes the tooth preparation, tooth-colored autopolymerizing (self-curing) acrylic resin (powder and liquid) is sprinkled into the impression. Sprinkling the powder and liquid is the usual method of mixing the self-curing resins. The polymer (powder) is simply wet with monomer (liquid) until excess liquid appears. In the area to be temporized, fill the impression with self-curing resin up to the gingival line. When the resin in the impression reaches a doughy stage, the impression is placed over the tooth preparation and remaining teeth in the arch. The dentist has the patient close on cotton rolls or folded gauze to maintain the position of the impression while the resin sets adequately. When the impression is removed from the patient's mouth; the temporary remains on the tooth. Use a blunt instrument to remove the temporary from the prepared tooth. The temporary must be finished before cementing it to the prepared tooth.

Another common method of fabricating an interim restoration involves the use of a plastic stint. The diagnostic cast is used along with clear thermoplastic material and a vacuum-forming machine to form the plastic stint. A mismatched, uncured resin denture tooth is adapted to the edentulous space on the diagnostic cast, sticky-waxed in place, and the occlusion is adjusted. The clear plastic material is then vacuum-formed over the cast. The part of the formed plastic that includes the region of the fixed prosthesis, plus one or two uninvolved teeth anterior and posterior to it, is cut to form the plastic stint. The dentist uses the clear plastic template (stint) as a mold to form a self-curing, temporary prosthesis in the patient's mouth, similar to the alginate impression method (fig 2-4, view A). The reason uninvolved teeth are a part of the template is so they can act as a seating index.

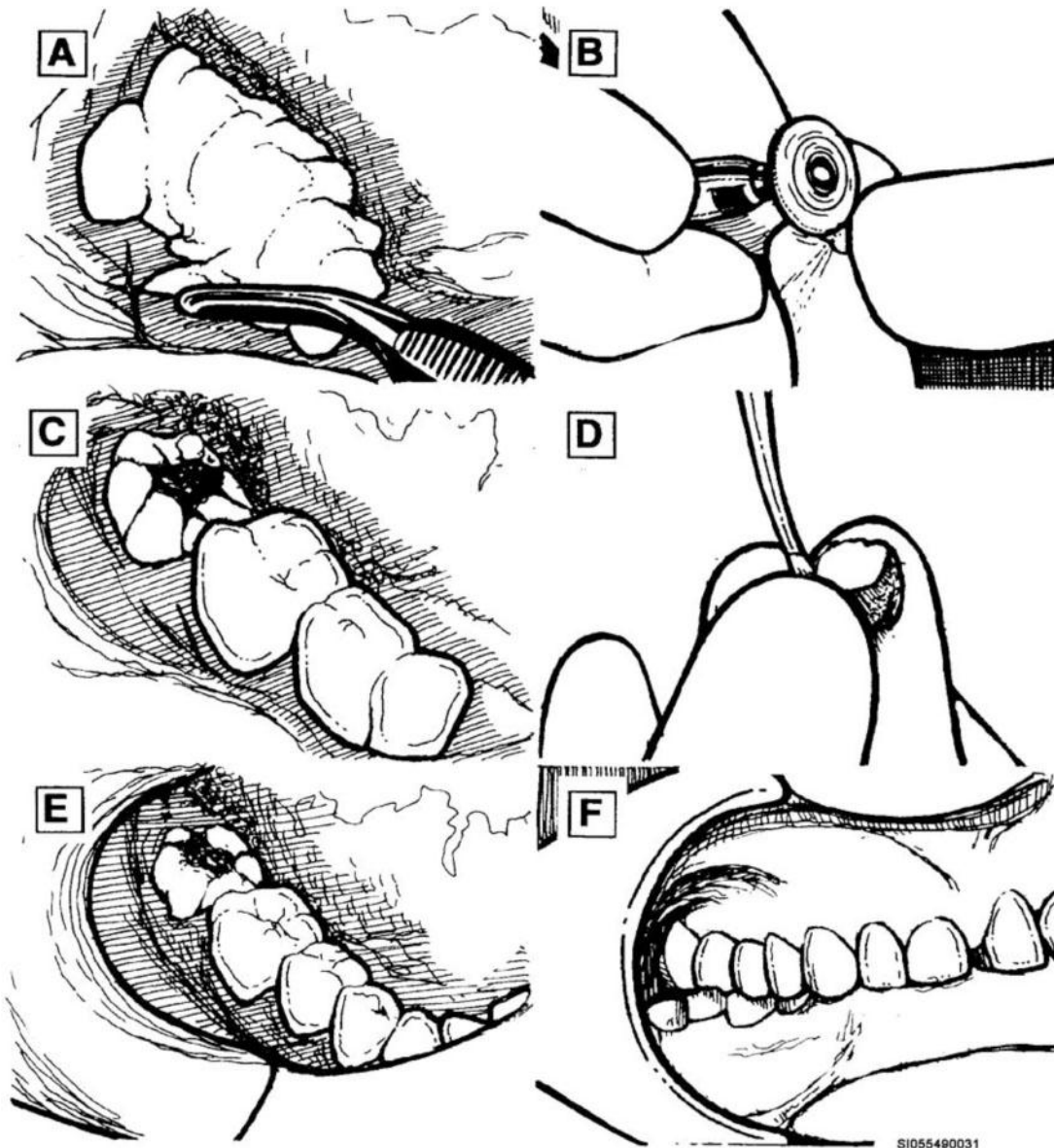


Figure 2-4. Fabrication of a temporary or interim prosthesis.

Figure 2-4 shows the basic steps of fabricating a temporary. The temporary must be trimmed, occluded, smoothed, and polished before cementing as an interim appliance (fig 2-4, view B). The dentist accomplishes some of this work at chairside; however, the final smoothing and polishing is completed in the laboratory. Temporary cement, such as zinc oxide and eugenol, is used to cement the interim appliance onto the prepared tooth or teeth. Consult the manufacturer's instructions for proper mixing of the material. Use a small bladed instrument to place the cement onto the surface of the temporary, which seats onto the preparation (fig 2-4, view D). Place the temporary onto the prepared tooth or teeth, and fully seat the temporary (fig 2-4, view E). After the temporary cement is fully set, use the mirror and explorer to gently remove all excess cement from the crown and gingival area (fig. 2-4, view F). The dentist will then adjust the occlusion of the crown. When completed, allow your patient to rinse his or her mouth with water to remove any debris or loosened excess cement.

At the end of this patient treatment, make appointment arrangements with your patient before dismissal. Also, be sure to annotate the DD Form 2322 with the date, time, and step of the next

treatment planned. This information is essential to the dental laboratory for fabrication of requested work.

412. Transferring fixed prosthetics to dental laboratory

Your coordination with the dental laboratory is critical between the preparation, final impression appointment, and insertion appointments. A vast amount of work must be performed in the laboratory between each patient visit. You'll briefly study the various stages of work accomplished in the laboratory during this time. Hopefully, this will provide enough knowledge and understanding of the basic process to enable you to coordinate effectively with the laboratory.

After receiving the final impression, the dental laboratory technician fabricates a working (master) cast, dies, and mounts maxillary and mandibular casts on an articulator. A working cast is a cast used to duplicate the patient's prepared tooth or teeth, other teeth present in the arch, and all associated soft tissue structures. It is used to establish the shape, proximal contacts, occlusion, and fit of fixed prostheses, from the simplest inlay to the most complicated complete mouth rehabilitation. A working cast contains one or more dies. A die is a positive reproduction of the prepared portion of a tooth in a hard, stable material such as improved stone, acrylic, or metal. Dies are composed of two parts: the duplicate of the prepared tooth and an extension. A die, by itself, has limited value until its relationship with adjacent and opposing teeth is established. The extensions of removable dies are keyed in some manner so that the die will not rotate and it can be placed back in the cast in the same position after every removal.

Before a die can be used to make a restoration, any dental stone that covers the margin of a preparation has to be trimmed away. This task is referred to as die-trimming and is usually accomplished by the dentist. The dentist completes this task in the laboratory or the dental treatment room (DTR). If the dentist prefers to trim dies in the DTR, you may be tasked to coordinate this stage with the laboratory. You'll also need to have the necessary instruments and materials available that the dentist needs to trim dies. This would include a compound knife with #25 straight blades, red pencil, cyanoacrylate glue (super glue), and die spacer.

To ensure that the margins are highly visible, the dentist outlines them lightly with a red pencil. The dentist may also want to paint the die's margin with cyanoacrylate glue to harden its surface and prevent smudging of the red pencil line.

Cement used during insertion of the appliance exerts pressure on the precision casting and could prevent complete seating. Painting the die with die spacer allows enough room for the film thickness of cement so that the casting will seat completely. The die spacer must stop about one mm from the margin of the preparation for proper margin fit.

With the exception of complete porcelain or complete resin restorations, at least part of a fixed prosthesis is cast in metal. Refer to figure 2-5 as you study the casting process. Castings are made from wax patterns. Either the dentist or a dental laboratory technician adapts wax to the dies and carves the wax to make a wax pattern. A wax pattern is an exact replica of a desired shape. Multiple units of a fixed partial denture are joined into a single prosthesis at the wax pattern stage or after the units are cast. Next, the wax pattern is placed on a sprue channel. A sprue is a channel formed by a wax, plastic, or metal pin through which molten metal will be cast into the mold. The purposes of a sprue channel are to provide an escape for pattern wax during the early stages of the burnout procedure, direct the molten metal from the crucible into the mold cavity, and provide a reservoir of molten metal upon which the casting may draw during solidification.

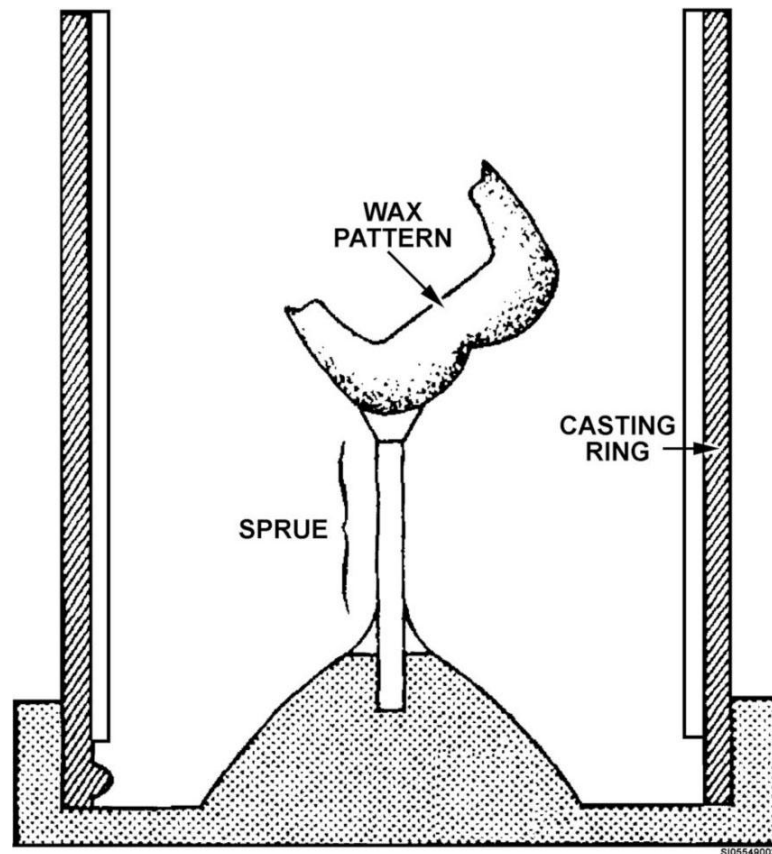


Figure 2-5. Casting ring with wax pattern.

After the sprue channel is attached to the wax pattern, it is placed in a casting ring and embedded in an investment (heat-resistant gypsum) material. This process is called investing. When the investment material hardens, the sprue channel is removed. The casting ring is placed in the burnout oven and the wax is then burned out to form a mold. Then, the casting ring is placed in the casting machine and molten metal is cast into the mold to form the casting.

After the casting is formed, the laboratory technician gives the appliance a preliminary satin-finish and adjusts the occlusion. If the appliance requires porcelain, the technician applies porcelain of the selected shade to the appliance. The technician fuses the porcelain to the metal by baking or firing the appliance in a porcelain oven. After the porcelain is fired onto the metal, the technician contours the shape and form of the porcelain with a handpiece and diamond burs. In this stage, when the laboratory completes a prosthesis with porcelain, but without a glaze, it is referred to as a *bisque bake*. As you can see, there is a great deal of work the dental laboratory must accomplish between the preparation, final impression, and insertion appointments.

413. Insertion of fixed prosthetics

The basic steps involved in inserting crowns and fixed partial dentures are the same as for the temporary appliance. Your instrument tray setup for insertion is the same as shown in figure 2-1. You'll need to include assorted stones and burs for adjustment of the prosthesis. Usually, anesthesia is not required since most patients can tolerate the minimal discomfort associated with insertion of the appliance. The basic steps involved at this appointment include removal of the temporary appliance, try-in and adjustment of the permanent appliance, stain and glaze, and cementation of the appliance.

Removal of the temporary

This task can be delegated to you, the dental assistant. Use an instrument, such as a stellite, to loosen the temporary cement bond at the margin of the temporary. Once you remove the temporary, clean the prepared tooth or teeth of any debris or retained temporary cement. Use a cotton pellet and cotton forceps to clean the prepared site. Remember to do this gently, as your patient will not typically have anesthesia and could experience some slight sensitivity.

Try-in

One of the first steps in the try-in of the appliance is the adjustment of proximal contacts. Proximal contacts between adjacent teeth should exist, but can be non-wedging. The proper amount of contact exists when there is a slight snap of dental floss as the dentist passes the floss through the contact areas.

If the prosthesis contains a tissue-contacting pontic, the next step is the adjustment of the gingival aspect of the pontic tip. The pontic tip should adapt passively to the residual ridge tissue. The dentist evaluates the pontic adaptation visually and by passing dental floss between the pontic tip and ridge tissue. When the prosthesis is fully seated, there should be very little, if any, pressure on the residual ridge mucosa.

Next, the dentist evaluates the occlusion and makes adjustment to provide a harmonious occlusal relationship. Articulating paper is used to mark any areas of interference between the prosthesis and opposing teeth. During this time, the dentist also ensures there are no interferences preventing the prosthesis from being fully seated onto the prepared tooth or teeth. Once the dentist ensures the prosthesis is fully seated, each margin of the prosthesis is checked and adjusted, if necessary. The final adjustments of the prosthesis include improvements in functional and esthetic contours. The dentist may make adjustments to the embrasure form (sloping space on either side of the proximal surfaces), cervical form, and incisal or occlusal shape.

If the prosthesis is completely metal, any surface roughness resulting from clinical adjustments is eliminated, and the metal is highly polished prior to cementation. If the prosthesis includes porcelain, the dentist usually characterizes the porcelain for maximum esthetics. This involves the careful addition of surface stains to the porcelain prior to glazing the prosthesis.

Stain and glaze

The desired effect of external characterization is to produce a restoration that is so natural as to prevent detection when seated in the patient's mouth. For example, every tooth will appear to have some degree of proximal staining. The intensity and color of the staining may vary with the age and lifestyle of the patient. A young patient may have very little proximal staining as compared to an older patient. The same comparison can be made between a patient who drinks coffee and one who doesn't.

The dentist often adds cervical staining to the prosthesis. The cervical areas of a tooth reflect the pink coloration of the gingiva and can also be stained. This effect varies from a light pinkish-orange color to an orange-brown color. Often, the dentist uses cervical staining to simulate the root portion of a tooth.

To match the natural teeth in the patient's mouth, the dentist applies stain to the prosthesis to create the appearance of hypocalcifications. These areas result from the removal of calcium from the enamel and appear as white blotches or even white lines.

Extrinsic staining procedures involve applying stains to the porcelain surface of a restoration to characterize or alter the shade. The stained restoration is returned to the laboratory where glaze is applied to the porcelain surface and the restoration is fired, that is, heating the restoration to a specified temperature and time range in a porcelain furnace. When stains are fired, they actually become a part of the porcelain, covered by a thin, transparent (glassy) glaze layer. Glazed porcelain

surfaces have been described as being impervious to oral fluids and biologically compatible with oral tissue. After firing, the laboratory highly polishes any exposed metal of the prosthesis and the restoration is now ready for cementation.

Cementing the prosthesis

There is no chairside procedure in fixed prosthodontics that requires more care than the cementation of the prosthesis. At this point, the quality of an otherwise excellent prosthesis can be reduced to merely satisfactory or even clinically unacceptable. Keep the treatment site clean and dry throughout the procedure. You, the assistant, must follow the manufacturer's instructions for dispensing and mixing the cement, regardless of the type of cement used. Improper mixing of any cement results in decreased physical properties of the material and could cause ultimate failure of the prosthesis.

Zinc phosphate cement has been recognized as an excellent permanent cementing agent for fixed prosthetics. However, the phosphoric acid present in zinc phosphate makes it highly acidic during the initial setting stage. Therefore, zinc phosphate can be quite irritating to the pulp tissues if the cementation process is not handled properly. Some dentists prefer to coat the preparation with copalite varnish prior to cementation with zinc phosphate. Other permanent cements, such as reinforced ZOE (zinc oxide and eugenol), EBA (ethoxybenzoic acid), PCA (polycarboxylate), and glass ionomer cements, are less irritating to the pulp tissues, and can be used instead of zinc phosphate. Generally, the dentist selects the type of cement he/she prefers to use as permanent cement. Follow the manufacturer's instructions for dispensing, mixing and utilizing the particular cement selected.

Refer to figure 2-6 as you study the steps of cementation:

1. Begin the cementation process by isolating the treatment site with clean, dry cotton rolls and drying the prepared tooth or teeth with a gentle blast of warm air or a cotton pellet and cotton forceps (fig 2-6, view A).
2. Prepare the cement according to the manufacturer's instructions.
3. Place cement into each retainer or crown in a manner that eliminates the possibility of trapped air. Some dentists prefer to paint cement onto the tooth (teeth) preparation with a small brush.
4. Seat the prosthesis over the prepared tooth (teeth) and apply firm finger pressure to the occlusal or incisal surface in order to express excess cement. The dentist does the final seating with heavier pressure.
5. In anterior areas, the final seating is done by tapping the appliance in place using an orangewood stick and plastic mallet.
6. The orangewood stick and mallet can be used in the posterior areas; however, the patient is generally instructed to bite into balsa wood or on an orangewood stick that is placed over the prosthesis. In this manner, the patient is applying biting pressure for the final seating.
7. While the cement is still fluid, the dentist uses a sharp explorer tip to examine the marginal fit and verify that the restoration is completely seated.
8. Ensure that the area remains dry while the cement sets by placing the saliva ejector into the patient's mouth.
9. Do not attempt to remove excess cement until it has set to the point of being "brittle-hard." After the cement hardens, use an instrument, such as a periodontal curette, to remove all cement from around the restoration, tooth, and gingival sulcus area.
10. Before dismissing patients with fixed prosthetics, instruct them in the procedures of cleaning the appliances. This is especially necessary if the appliance contains a pontic or is a fixed splint. Use the show, and tell approach described below.
11. Show the patient what superfloss or a floss threader is, then explain how to use these items. Finally, have the patient demonstrate what you have shown.

12. While the patient is performing the cleaning procedures, correct his or her technique if necessary.

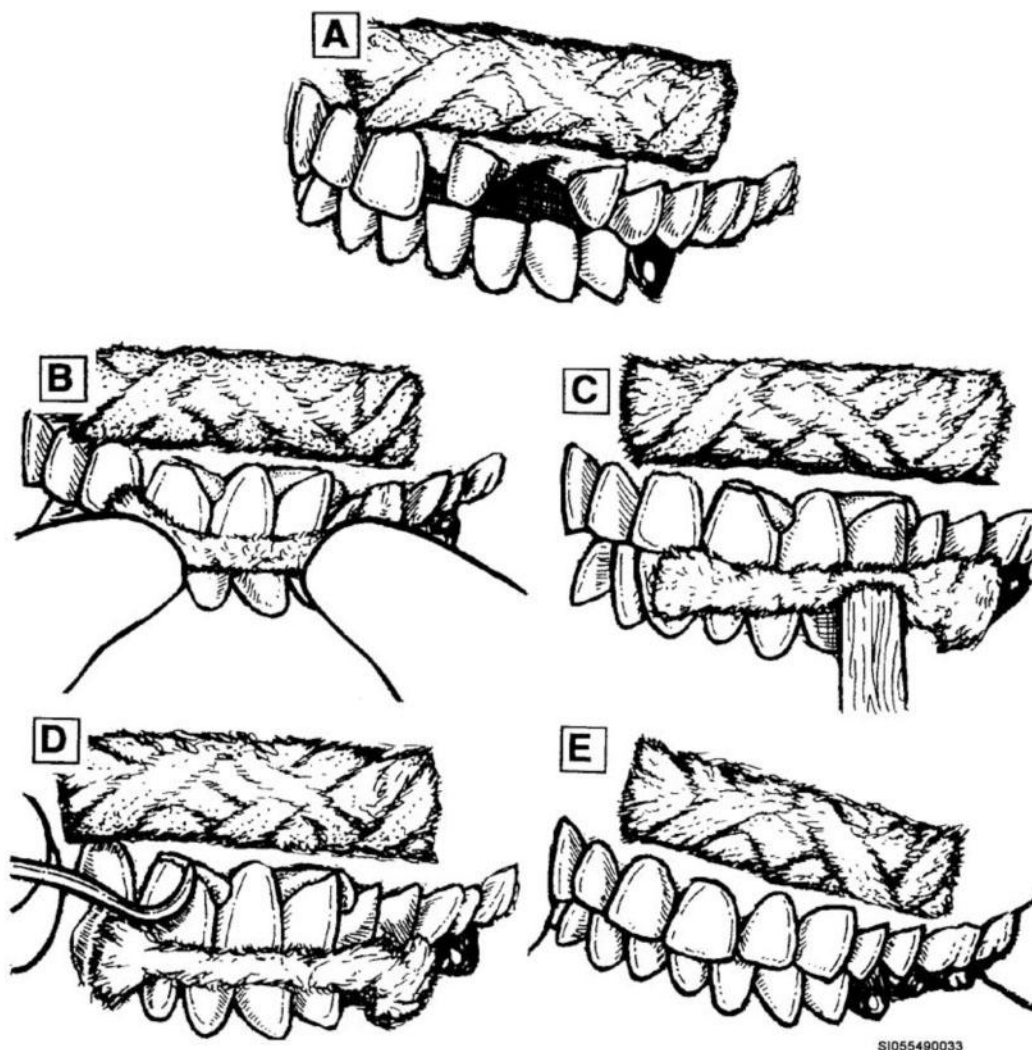


Figure 2-6. Steps in cementing a permanent fixed partial denture.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

411. Evaluation, preliminary impressions, preparation and final impressions procedures

1. At what appointment are preliminary maxillary and mandibular impressions made for fabrication of study casts or diagnostic casts?
2. What form should you have completed as much as possible prior to the initial appointment?
3. Whose responsibility is it to coordinate prosthodontic cases with the dental laboratory?

4. Explain what type of coordination is needed with the dental laboratory after the initial appointment.
5. What should be included when transporting the preliminary impressions to the dental laboratory?
6. List the steps the dental laboratory technician will perform for fixed prosthetics after the preliminary impressions are made.
7. What action will you need to take before the patient's next appointment?
8. When is it best to select a shade for a tooth?
9. For porcelain, which shade guide should be used in shade selection at the chairside?
10. Briefly explain how light source affects color.
11. What light source produces consistent illumination?
12. How can you enhance your ability to evaluate the color of objects?
13. What are the dominate colors of natural teeth?
14. If a satisfactory match to the natural tooth shade is not available, how is the shade selected?
15. What does tooth preparation for a full crown involve?
16. What is a margin of preparation and what does it represent?

17. What is the primary purpose of the initial preparation?
18. What tool does the dentist use to accomplish the initial preparation?
19. What are you responsible for during the initial preparation?
20. When the dentist begins the initial preparation, why is it most efficient to reduce the occlusal or incisal surface first?
21. What is used to displace the free gingiva from the tooth as a method of controlling damage of the supporting tissues of the tooth during tooth preparation?
22. What is the most popular impression material used for routine fixed prosthodontic procedures?
23. What type of tray is commonly used when making a final impression for fixed prosthodontic procedures?
24. What determines the success of the tray technique when making a final impression for fixed prosthodontic appliances?
25. What are the two functions served by properly positioned gingival retraction cord?
26. What must you do to the custom tray before preparing the impression materials?
27. How is impression material of two different viscosities usually used to make a final impression for fixed prosthetic appliances?
28. Why would a bite registration be needed for a fixed prosthodontic appliance fabrication and what common methods can be used?

29. Briefly describe how the dentist makes a face-bow transfer for fixed prosthetic cases.
30. What is the purpose of a provisional restoration or FPD?
31. Briefly describe how a provisional restoration or FPD should be properly fabricated.
32. What items are available for use as temporaries for single tooth preparations?
33. Briefly explain how to make a temporary using a full-arch impression prior to tooth preparation.
34. Explain how an interim appliance is made for an FPD using a plastic stint.
35. What must be done to the temporary before it can be cemented into the patient's mouth?
36. Briefly list the steps necessary to cement a temporary.
37. What administrative tasks must you complete at the end of the preparation and final impression appointment?

412. Transferring fixed prosthetics to dental laboratory

1. Why is your coordination with dental laboratory critical between the preparation and final impression appointment, and the insertion appointment?
2. What is a working cast and what are its uses?
3. What is a die?
4. What are the two parts of a die?

5. Why are dies keyed?
6. What must be done before a die can be used to make a restoration? What is this task called?
7. What instruments and materials should be available for the dentist during die trimming?
8. What does the dentist do to ensure the margins on the dies are highly visible, have a hardened surface, and resist smudging?
9. Explain why die spacer is used and where it must stop.
10. What is a wax pattern?
11. What is a sprue? What is its purpose?
12. What is investing?
13. Briefly describe what happens after investing.
14. How is porcelain fused to the metal casting?
15. What is meant by the term bisque bake?

413. Insertion of fixed prosthetics

1. Describe how to remove a provisional restoration or FPD.
2. Briefly list the five steps in the try-in of a fixed appliance.

3. How are proximal contacts between adjacent teeth checked?
4. How does the dentist evaluate the pontic adaptation?
5. What type of improvements in functional and esthetic contours may the dentist make as part of the final adjustments?
6. What is done before cementation if the prosthesis is fabricated completely of metal?
7. What is done before cementation if the prosthesis includes porcelain?
8. What is the desired effect of external characterization?
9. Briefly explain what the dentist does to add characterization.
10. What is applied to the porcelain after the stain?
11. What must be done before the stained and glazed prosthesis can be cemented?
12. Why is cementation of the prosthesis a critical procedure?
13. What can result from improper mixing of any cement used for cementation of a fixed prosthesis?
14. What can be applied prior to cementation with zinc phosphate? Why?
15. What cements, other than zinc phosphate, are used to cement fixed prosthesis?
16. How is the treatment site prepared at the beginning of the cementation process?

17. How is the material used to cement the appliance prepared?
18. Where and how is the cement placed on the retainer or crown?
19. Describe how a fixed appliance is seated.
20. What does the dentist do after seating the appliance while the cement is still fluid?
21. What is used to ensure that the area remains dry while the cement sets?
22. When is the excess removed? Describe how this is done.
23. What instructions do you give patients if their appliance contains a pontic or is a fixed splint?

2-2. Complete Denture Procedures

Complete dentures are fabricated by using a series of steps the dentist, assistant, and laboratory technician perform as a team. Each step must be performed accurately and precisely. A slight error during any procedure can easily result in an unsatisfactory prosthodontic appliance. You'll study the series of appointments necessary to provide treatment and the major steps in complete denture construction.

414. Evaluation, preliminary impressions, border mold, and final impression-procedures

The patient considering a complete denture must understand the steps and commitment to the process of the denture. You, as the assistant must also understand these steps, to help the patient understand. It is usual for a complete denture fabrication to require six appointments, starting with a complete dental evaluation.

Evaluation and preliminary impressions

The first appointment for complete denture fabrication begins with the standard prosthodontic evaluation by the dentist. Have a mirror, explorer, and cotton forceps setup on the bracket tray. Also, have the impression material, powder scoop, water measure, spatula, mixing bowl, stock trays, and utility wax ropes available. You'll seat, drape, and position the patient in the dental treatment chair. Have the patient remove any existing dentures and place them in a container of water. The dentist will perform a clinical examination using radiographs to conduct the evaluation, form a diagnosis, and determine a treatment plan. During this appointment, either you or the dentist will make maxillary and mandibular preliminary alginate impressions.

Request and coordinate with the laboratory on the fabrication of items needed to perform chairside procedures involved in fabricating the complete denture. Indicate the need for study or diagnostic casts and custom trays for the next appointment. Request completion of these items prior to the date and time of the patient's next scheduled appointment, and indicate this on the DD Form 2322.

Since complete denture fabrication requires six appointments, it's ideal to arrange the entire appointment series with the patient at the initial appointment. To accomplish this, you'll need an agreement with the dentist and laboratory. Basically, you need an agreed minimum standard of time between each appointment for the various stages of treatment and laboratory work required. When you arrange the patient's appointments, annotate the dates, times, and items needed at each appointment on the DD Form 2322.

After the preliminary impressions are made, clean and disinfect them according to the recommended infection control standards, then transport the impressions to the dental laboratory along with the DD Form 2322. The dental laboratory technician pours the impressions to make diagnostic casts and fabricates a custom tray, then places these items into a metal prosthetic case pan along with the DD Form 2322. Prior to the patient's next appointment, retrieve the case pan and ensure the items requested have been fabricated by the laboratory.

Border mold and final impression

At the second appointment, the dentist border molds the custom tray and the final impression. The tray will be made of acrylic resin, shellac record base, or special tray material. You'll need the following items for this procedure:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Sharp compound knife or disposable blade knife.
- Compound stick.
- Bunsen burner.
- Compound heater.
- Custom tray.
- Tray adhesive.
- Impression material.

First, to prepare for the border molding procedure, the dentist tries the custom impression tray in the patient's mouth to check the fit. Next, the dentist adjusts the borders of the tray to the proper length with the compound stick. The dentist heats the compound stick with a Bunsen burner and fuses it to the edges of the custom impression tray. Then, the dentist dips the tray into the warm water in the compound heater. With the compound warm and somewhat pliable, the dentist places the tray into the patient's mouth and manipulates the tissue adjacent to the compound. This action records the proper peripheral border anatomy in the compound. Usually, the dentist border molds the tray in sections, rather than all at once. The dentist uses the sharp compound knife to trim any excess compound from the custom tray.

After the border mold is complete, paint the tray with the appropriate tray adhesive wherever the impression material will be placed. The impression technique for complete dentures calls for a thin coating of impression material placed in the custom tray. The dentist usually uses a light body, polysulfide (rubber-base) impression material. Follow the manufacturer's instructions for dispensing and preparing the impression material. Use caution when preparing the impression material as it may not be removed if it soils the patient's, dentist's, or your clothing. Load the custom tray in such a manner that all surfaces are equally covered. However, do not overload the tray. Place only enough

material to record fine detail in an already well-adapted custom tray. If care is not taken, overloading could cause a dangerous gag reflex, and the patient could aspirate the material into his or her trachea. After the dentist places the impression tray into the patient's mouth, use the saliva ejector or high volume evacuator to keep the patient from swallowing unnecessarily and consequently causing a gag reflex. The dentist may also use a mouth mirror to remove excess material from the patient's mouth, if this is the case, hold a gauze square to wipe the material from the mirror. After the dentist removes the impression from the patient's mouth, allow the patient to rinse his or her mouth with water. Hand the patient a hand mirror and tissue or gauze to remove any excess material from his or her face. Return any existing dentures to the patient.

Clean and disinfect the impression according to the current infection control standards before taking it to the laboratory. Be sure to coordinate with the laboratory for fabrication of a record with an occlusion rim. Be sure to coordinate with the laboratory for fabrication of a record with an occlusion rim and annotate the items requested.

After you take the final impression to the laboratory, the technician pours the final impression to form the master cast and makes the record base with the occlusion rim. Record bases and occlusion rims, as shown in figure 2-7, are a combination of a base material that accurately fits the cast (record base) and an arch-shaped wax buildup (occlusion rim). The record base, also referred to as a baseplate, is constructed on the master casts and extends over the area designated for denture coverage. It temporarily represents the base of a denture. The occlusion rim, also referred to as a bite rim, is made of several layers of record base wax molded together. It simulates the amount of space formerly occupied by natural teeth and related tissue. Occlusion rims are constructed to standard, average dimensions, and attached to record bases. During the patient's next appointment, the dentist will modify the shape, height, and thickness of the occlusion rim in keeping with the person's appearance and functional requirements.

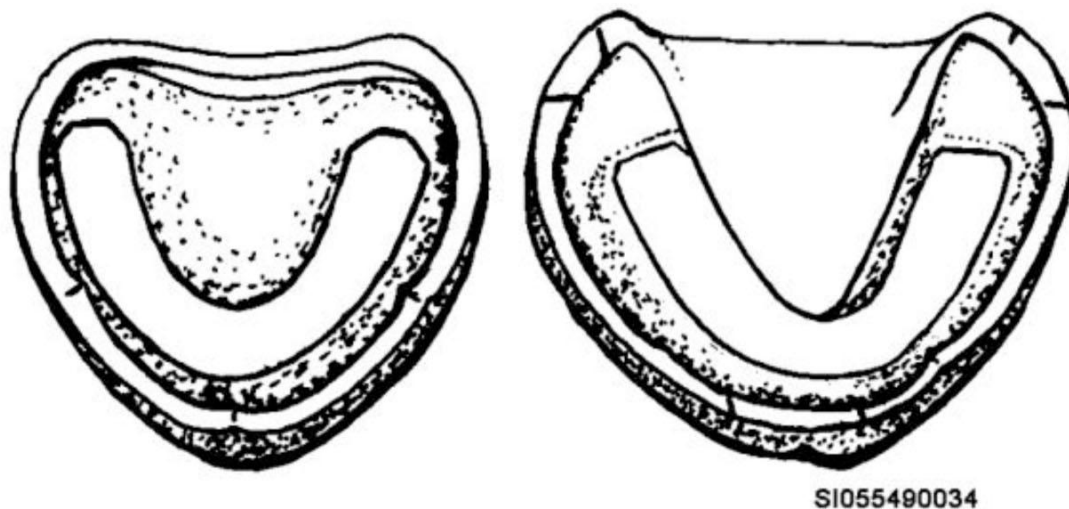


Figure 2-7. Record bases with occlusion rims.

415. Jaw relation records and denture tooth selection for complete dentures

At the third appointment, the dentist records the relationship of the patient's maxilla to the mandible with the use of a face-bow transfer and interocclusal recordings. Have the following items available:

- Mouth mirror.
- Explorer.
- Cotton forceps.

- Bunsen burner.
- Wax melting plate.
- Wax spatulas.
- Sharp knife.
- Face-bow.
- Record base with occlusion rim.
- Shade guides.

The dentist uses the record base with occlusion rim to record the interocclusal relationships and determine the amount of facial tissue support the patient needs. The dentist does this by contouring the occlusion rims and making a record of the patient's centric relation and vertical dimension of occlusion. At this appointment, the dentist also makes a denture tooth selection, which includes the shade, size and shape of the teeth. To help you understand what the dentist must accomplish during this appointment, the following terms and their definitions are provided:

Term	Definition
Occlusion	Any contact between opposing cutting or chewing surfaces of maxillary and mandibular teeth. Many patterns of tooth contact are possible. Part of the reason for the variety is the mandibular condyle's substantial range-of-movement within the temporomandibular joint.
Maximum intercuspation (MI)	Complete intercuspation of the opposing teeth independent of condylar position.
Centric relation	A maxillomandibular relationship in which the condyles articulate with their respective discs in the anterior-superior position of the glenoid fossa against when all teeth are lost, determining where the condyles fit into the glenoid fossa at MI is difficult. In these cases, dentists use the highly reproducible centric relation position to horizontally orient the lower jaw for prosthesis construction procedures.
Centric occlusion	Occlusion of teeth when the mandible is in centric relation. This may or may not coincide with MI.
Vertical dimension	Any measurement of vertical distance made between the upper and lower jaws. A mandible can travel and stop anywhere on a path between maximum opening and closure. To have meaning, it should identify a place along the potential path of travel that the dentist and patient can find on demand. The term "vertical dimension" with no further description of conditions, is meaningless.
Vertical dimension of occlusion (VDO)	The vertical distance between the upper and lower jaws when natural teeth or denture teeth are in MI. The presence of teeth (natural or artificial) controls how far the mandible can travel vertically toward the upper jaw. When teeth are badly worn or gone, "stops" at the correct VDO do not exist. The dentist needs a reliable guideline to estimate where the vertical movement of the mandible toward the upper jaw should stop so that the dental restorations can be made accordingly.
Physiologic rest of vertical dimension	Measurement of vertical dimension made between the jaws when the muscles controlling the mandible are relaxed. Vertical measurement should be made a number of times during the same appointment. The readings should not vary more than onemm. More importantly, the occlusal vertical dimension in most people with a natural dentition is two to four mm less than the physiologic rest measurement.

Face-bow transfer

Most dentists prefer to make a face-bow transfer at the beginning of this third appointment. A face-bow is a caliper-like device. By using the face-bow transfer procedure, a maxillary cast can be

positioned in an articulator in the same way that a patient's maxilla relates to the temporomandibular joints. Refer to figure 2-8 for identification of the parts of the face-bow assembly.

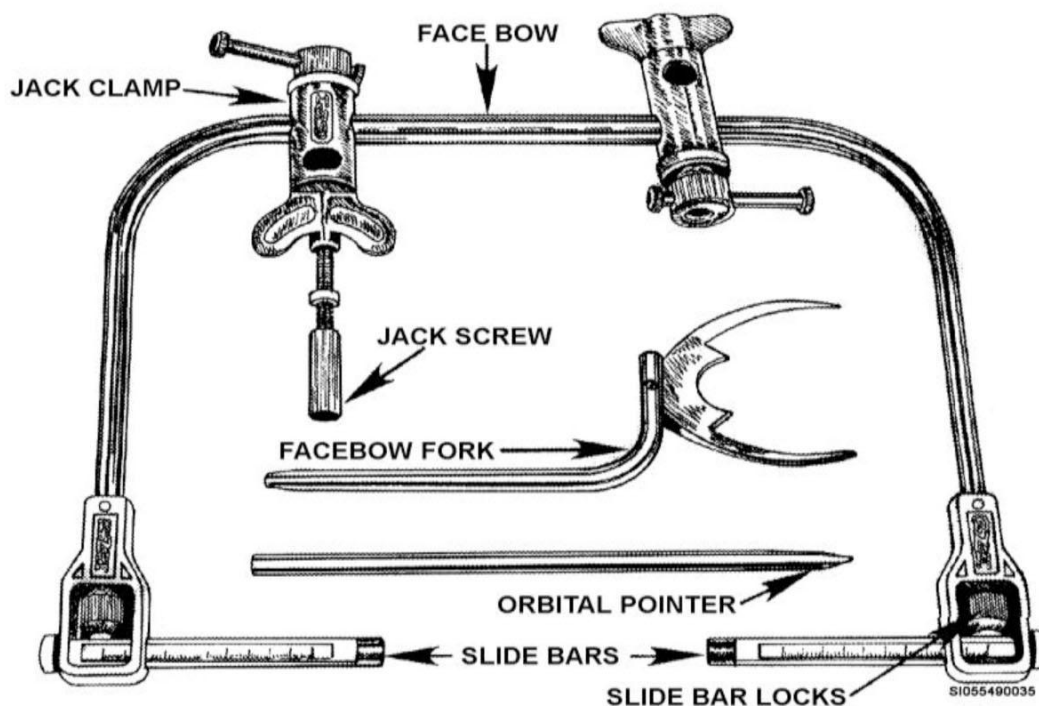


Figure 2-8. Parts of the face-bow assembly.

The steps of the face-bow transfer procedure are:

1. Dentist heats the face-bow fork and fuses it to the maxillary occlusion rim, orienting the plane of the fork parallel to the plane of the wax rim.
2. Dentist locates the patient's condyles by any one of a number of methods, and marks their positions on the surface of the patient's skin.
3. Dentist inserts maxillary occlusion rim with attached face-bow fork into the patient's mouth, and places the face-bow over the patient's face with the stem on the face-bow fork entering the clamp.
4. Dentist locks the ends of the slide bars over the skin marks that indicate the location of the condyles.
5. Dentist locks the face-bow fork together with the clamp. The dentist then removes the entire assembly from the patient as a unit, and you will take the assembly to the laboratory.
6. Laboratory technician uses the face-bow transfer to mount the maxillary master cast in an articulator.
7. When the cast is mounted, the laboratory technician returns the record base with occlusion rim to the dentist.

Denture tooth characteristics and selection factors

While the dental laboratory technician mounts the maxillary master cast to the articulator, the dentist begins the process of selecting the shade and mold of the denture teeth. Frequently, your assistance will be requested to help select the most esthetic shade, shape, or arrangement of denture teeth for the patient. Patients' teeth differ significantly from person to person. To allow for this, manufacturers produce many different kinds of denture teeth.

Denture teeth are available commercially in maxillary anterior, mandibular anterior, maxillary posterior, or mandibular posterior matched sets that are made from porcelain or plastic. Anterior tooth sets consist of six teeth, while posterior tooth sets consist of eight teeth. Differences in shape, size, and color (among other characteristics) make the sets distinct from one another. A full complement of denture teeth has 28 teeth because third molars are not used in the fabrication of complete and removable partial dentures.

The primary factor in selecting anterior denture teeth is the esthetic effect of the patient's total image, which includes matching the size, shape, color, and arrangement of denture teeth to a person's anatomical measurements, face form, sex, and age. Pre-extraction records are excellent guides to the patient's original tooth shapes and arrangement. The best kind of record is a plaster cast of the patient's dental arch made before extractions were performed. Unfortunately, very few patients have these types of casts in their possession. However, most patients can provide a dentist with a full-face photograph showing natural teeth. When photographs or casts of the patient's natural teeth are not available, the dentist uses other methods of selecting, modifying, and arranging denture teeth. Selecting denture teeth for esthetic value, centers around choosing the set's general size, shape, and color. Modification refers to personalized alterations to the size, shape, and color of the teeth in the set. Denture tooth arrangement refers to positioning teeth in a pleasing, functional manner.

When selecting maxillary anterior denture teeth for esthetic value, the dentist considers tooth size, shape, and shade. The denture tooth size is a combination of facial length and width. The tooth shape or mold relates to the shape of the person's face. Research has proven that an inverted maxillary incisor tooth has roughly the same shape as the person's face, both in the profile and frontal view. The dentist uses a shade guide, as shown in figure 2-9, to select the shade of teeth. Teeth are blends of grays and yellows; however, traces of other colors will most likely be present. Color choice is mainly a function of the patient's age. Natural teeth tend to get darker with advancing years and acquire food and tobacco stains. One sure way to create a false-looking denture is to use very light colored teeth for an older person. Lighter shaded teeth are selected for fair skinned, blond people because darker shades would probably look unsightly.

NOTE: This is only a guide and is not universally true.

To select mandibular anterior denture teeth, the dentist uses a mold chart as a guide. The mold chart indicates the mandibular anterior tooth size and shape that goes well with the selected maxillary anterior tooth mold.

When selecting posterior denture teeth, the emphasis shifts from esthetics to function. Esthetics is still important, but when the dentist selects posterior denture teeth, function is more important. The dentist also decides on the posterior tooth shape or mold and choice between porcelain and plastic posteriors. Posterior denture tooth shape refers to the presence or absence of cusps (cusp height). Since natural posterior teeth are darker than the anterior teeth in the mouths of most people, the dentist tends to choose a posterior denture tooth shade one shade darker than the anterior shade selected. Once the dentist selects the denture tooth shade and mold, record this information on the DD Form 2322.

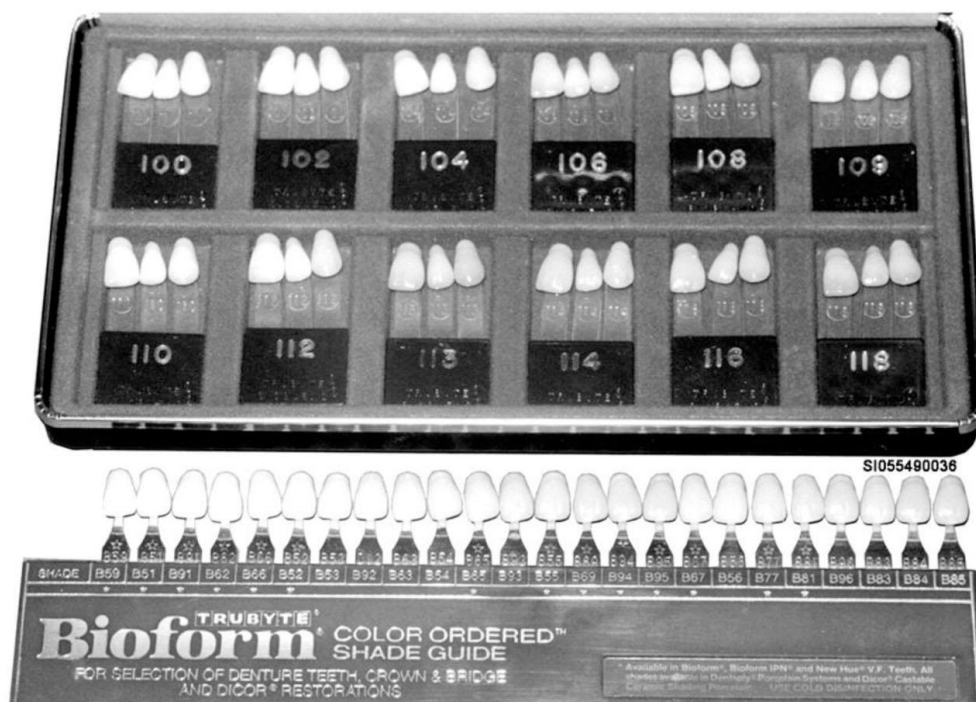


Figure 2-9. Shade guides for denture teeth; Top: Bioblend shade guide used for shade selection of anterior teeth; Bottom: Bioform shade guide used for shade selection of posterior teeth.

Contouring the occlusion rim for denture teeth

After the laboratory mounts the maxillary master cast, the dentist uses the record base with occlusion rim to assist in the selection and proper positioning of denture teeth. The dentist does this by:

1. Shaping and positioning the labial surfaces of the occlusion rims to approximate the amount of lip support required by the patient (fig. 2-10).

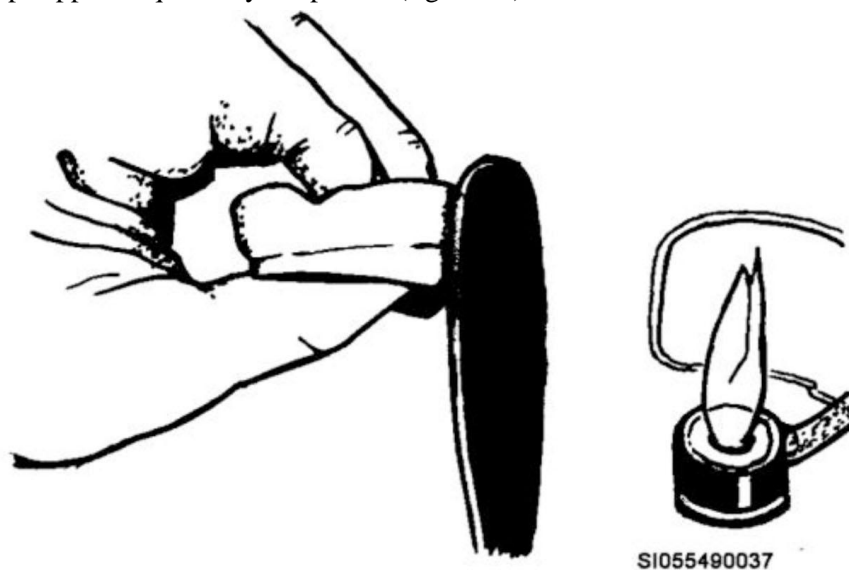


Figure 2-10. Contouring facial surfaces of the occlusion rim with a spatula.

2. Adjusting the vertical length of the maxillary occlusion rim to indicate the length of the incisor teeth (fig. 2-11).

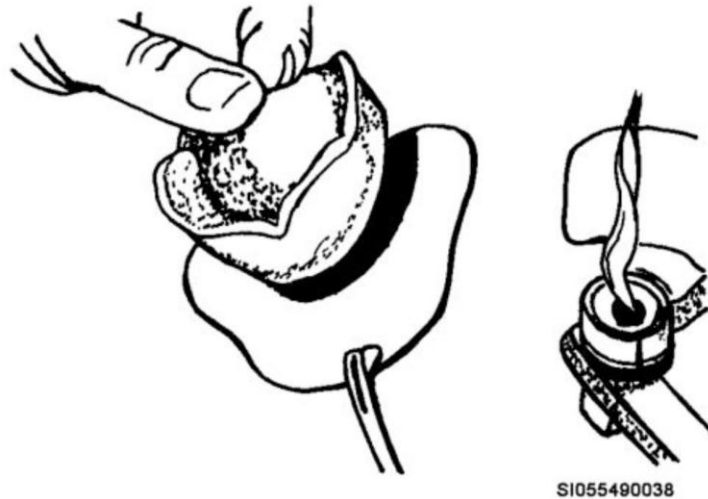


Figure 2-11. Reducing the occlusal surface of the occlusion rim with a wax melting plate.

3. Scribing marks on the occlusion rims as aids in choosing and positioning denture teeth (fig. 2-12). Usually, the markings are made on the maxillary occlusion rim; however, they occasionally carry over onto the mandibular rim. The dentist makes a midline marking to represent the center of the patient's face. Some dentists mark the high lip line on the maxillary rim. This line indicates the level to which the upper lip rises when the patient smiles. It aids in determining the gingivoincisor length of maxillary denture teeth so the patient displays a minimum of denture base. The dentist places a cuspid line on the right and left sides. They represent the estimated positions of the long axis of the cuspids. The distance between the lines is used to select the proper width of the six anterior teeth.

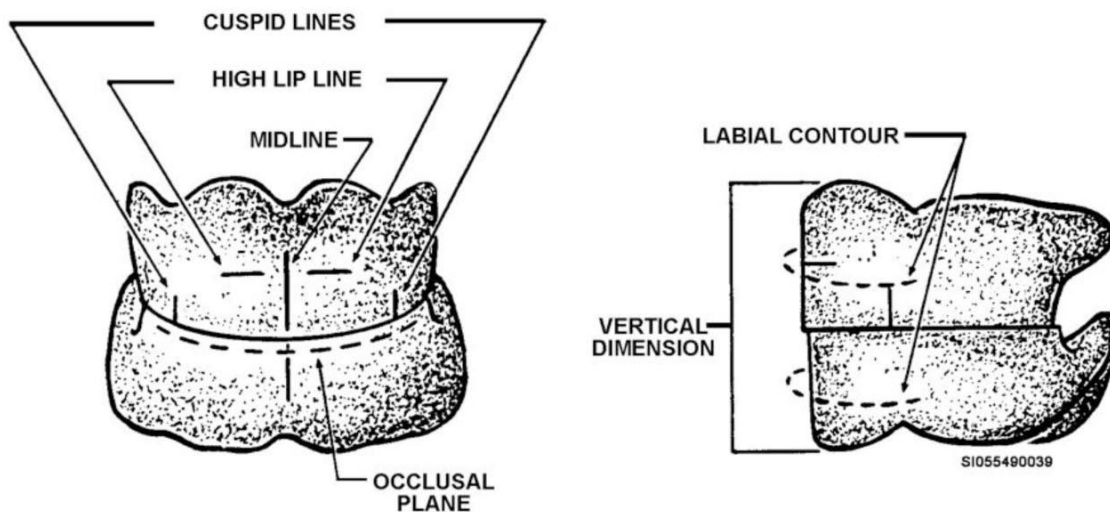


Figure 2-12. Occlusion rim markings.

Estimating occlusal vertical dimension

The dentist also uses the record base with occlusion rim to estimate the VDO based on speech sounds. The principle behind speech sound (phonetic) VDO estimates is simple. In a normal, natural dentition, teeth barely miss contacting when "s" and "ch" sounds are spoken. The vertical dimension a person uses to form these sounds stays about the same throughout adulthood, even though the dental arches might show severe wear or complete tooth loss.

Errors can occur when establishing vertical dimension of occlusion. These errors include open and closed VDO. Patients exhibit certain signs and experience various symptoms when the VDO is incorrect. Open VDO occurs when the patient's upper and lower jaws are being held too far apart when natural or artificial teeth meet in maximum intercuspation. Fixed prostheses, such as single crowns, multiple crowns, or fixed partial dentures can be responsible for this problem when natural teeth are present. Improperly made removable prostheses could cause an open VDO in partially or completely edentulous people. An open VDO usually results when a dentist makes an inaccurate VDO estimate or from a technician's error in the construction of the prosthesis. Some of the more common symptoms associated with an open VDO are muscle of mastication soreness, the inability to pronounce "s" and "ch" sounds clearly, and the teeth make contact noises while the person is talking.

In the case of a closed VDO, the patient's jaws are too close together when natural or artificial teeth hit in maximum intercuspation. Some causes of closed VDO include severe wear of natural or artificial chewing surfaces, or marked resorption of the residual ridges in a person who has been wearing the same set of complete dentures for years. Closed VDO can also occur if the dentist makes an erroneous estimate of the correct VDO during prosthesis construction procedures or from a technician's error. Some clues that a VDO closure exists are reduced biting power, and a great deal of space is visible between upper and lower teeth while "s" sounds are spoken (the teeth should barely miss).

Sequence to determine vertical dimension of occlusion

A dentist might use the following sequence to determine a patient's correct VDO:

1. Makes a point to start the procedure with occlusion rims that obviously hold the jaws too far apart. It causes the patient to excessively slur "s" sounds. It also causes occlusion rims to hit when the patient attempts to speak.
2. Makes a physiologic rest vertical dimension measurement and quickly reduces the vertical height of the wax rims to match the measurement (fig. 2-11).
3. From this point on, the dentist carefully cuts back the height of the occlusion rims and continually tests the patient's speaking abilities.

The dentist reaches the correct VDO when pronunciation of the "s" sound is distinct and the occlusion rims barely miss each other when the sound is spoken.

Combined VDO and centric relation record

The dentist also uses the record base with occlusion rim to make a combined VDO and centric relation record. This is a type of lower to upper jaw relationship record consisting of occlusion rims locked together at the correct VDO estimate in centric relation. To do this, the dentist makes an estimate of the correct VDO as previously described. Next, the dentist positions the mandible in centric relation and either keys the occlusion rim with grooves or seals the rims together (fig. 2-13). The dentist removes the entire assembly from the patient's mouth, and you take the assembly to the dental laboratory. Coordinate with the laboratory for the wax try-in and arrange the next appointment with the patient. On DD Form 2322, annotate the items needed for the next appointment and record the date and time of the patient's next appointment. Also, record the shade and mold of the denture teeth the dentist selected.

The laboratory technician uses the VDO and centric relation record made from the record bases with occlusion rims to mount the mandibular master cast in the articulator. The technician also uses the record bases with occlusion rims as a foundation for arranging denture teeth to construct wax trial dentures.

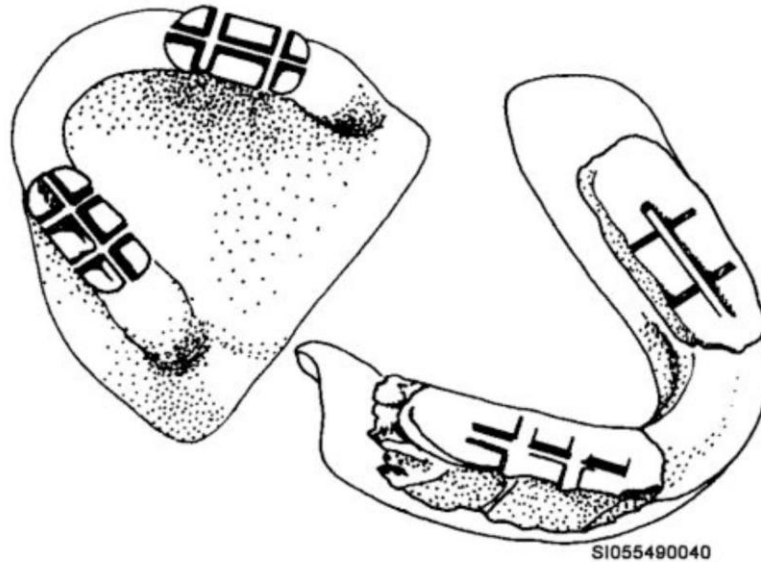


Figure 2-13. A type of jaw relationship record (bite registration).

416. Try-in of complete denture wax setup

At the fourth appointment, the dentist uses wax trial dentures to verify that jaw relations and denture esthetics are correct. You'll need the following items for this appointment:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Wax knife.
- Bunsen burner.
- Various wax spatulas.
- Stones.
- Discs to alter tooth arrangement and shape, if necessary.

Before the patient arrives, have the trial dentures in the dental treatment room (DTR) on the master casts to prevent warpage.

NOTE: Do *not* allow the acrylic record bases to dry out completely. Store the trial dentures in a plastic resealable bag with a wet cotton roll.

The dentist tries the trial denture in the patient's mouth for appearance and tooth contact relationships. The dentist checks the shade and mold of the teeth and simulated alignment of the teeth for adaption with the patient's lips and face. Next, the dentist checks the extension of the flanges of the denture for patient comfort and retention of the prosthesis in the mouth during facial and tongue movements. The dentist also checks the amount of fullness provided by the wax in the anterior and lateral facial areas for a natural appearance. The dentist then checks the occlusion of the dentures, adaption of the patient's lips, and ability of the lips to cover the teeth and form a smile. Since the teeth are setup in wax for the try-in, the dentist will move them about, if necessary, for both esthetics and function. The dentist may also make changes in the arrangement of the teeth to suit the patient's desires. Have a hand mirror available for the patient to view the results. As the dental assistant, you may be invaluable in reassuring the patient that the new teeth look acceptable and have a pleasing effect. You can also aid the dentist, by providing suggestions for improvements of the esthetic appearance of the wax setup, when asked. After the patient and dentist approve the trial denture,

return them to the laboratory for processing. Coordinate a completion date with the laboratory and make another appointment for the patient. Record this information and any instructions for modification of the wax setup on the DD Form 2322.

To finish the fabrication of complete dentures, the technician invests or flasks the wax trial dentures, boils out (heats) the flasks, and removes the record base material and wax. Next, the technician packs the mold with denture base resin and cures the resin. Then, the technician recovers the cured dentures from the mold and remounts the dentures in the articulator. Before delivery, the technician corrects processing errors with selective grinding, finishes, and polishes the dentures.

417. Insertion and post insertion adjustments for complete dentures

The complete denture patient requires an appointment for denture insertion and another for post insertion adjustments to conclude the treatment.

Insertion

At the fifth appointment, the dentist delivers the complete dentures to the patient. Before the patient arrives, get the dentures from the laboratory. Have the following items available:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Burs.
- Stones.
- Articulating paper and holder.
- Pressure indicator paste.
- Disposable brush.
- Hand mirror available for the patient to view the final results.

After you've applied a light coat of pressure indicator paste to the tissue side of the dried dentures with a stiff brush, the dentist inserts the completed denture into the patient's mouth. When the dentist removes the denture, excessive pressure leaves a bare spot on the denture that shows the point where pressure is exerted. The dentist then relieves these areas on the dentures. The dentist also checks the edges of the dentures and makes any adjustments necessary. Next, the dentist refines the occlusion and articulation of the denture teeth with articulating paper and stones in the handpiece.

After all adjustments are made, disinfect the dentures before returning the prosthesis to the laboratory for a final polishing. Scrub the dentures carefully with soap and water before returning them to the dentist for final delivery.

Give the patient instructions on the proper care and wearing of the dentures. Instruct the patient to remove the denture and thoroughly clean all surfaces at least once each day. You may recommend that the patient use a special denture brush for this purpose. Advise the patient to carefully hold the denture over a sink half-filled with water when cleaning the denture. This will minimize any damage if the patient drops the denture. Instruct the patient to thoroughly rinse the oral tissues while the denture is not in the mouth. Inform the patient to keep the denture moist when not being worn to avoid warpage of the acrylic.

Also, recommend the patient remove the denture from the mouth for several hours during each 24 hour period. Some patients will naturally do this when they sleep. Other patients may have difficulty understanding why they should ever be without their dentures. For these people, you might compare removing their dentures to the concept of removing their shoes, which they would not wear 24 hours a day. Stress to these patients that removing the denture is necessary to maintain healthy oral tissue. Before dismissing the patient, arrange an appointment for post insertion adjustments for the next day.

Post insertion adjustments

It may take the patient several days to a week to fully adjust to wearing new dentures. The patient can develop areas of irritation or denture sores where the denture may be overextended or presses too hard on the tissue. To prevent sore spots from occurring, the dentist needs to see the patient the day after insertion of the dentures. Arrange the sixth appointment for the next day, at which time the dentist will relieve acrylic areas on the denture and make occlusion adjustments to prevent sore spots from occurring. Have the following items available for this appointment:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Pressure indicating paste.
- Disposable brush.
- Indelible pencil or disposable indelible marker.
- Articulating paper and holder.
- Selection of stones and burs for use in the handpiece.

The dentist may use the pressure indicating paste in the same manner as it was at the insertion appointment. Sometimes a dentist will prefer to use an indelible pencil or disposable indelible marker to mark the sore spot in a patient's mouth. The dentist will then place the dentures into the patient's mouth to transfer the marking onto the tissue side of the denture. The dentist will use selected burs and stones to relieve the areas on the acrylic. Next, the dentist will make any occlusion adjustments necessary.

Polishing

After the dentist finishes making all the adjustments, disinfect the dentures and take them to the laboratory for a final polish of the adjusted areas. The polishing process starts with pumicing out large scratches from the denture base. Use a wet mix of pumice and apply it to the denture every time you place the denture in contact with the pumicing attachment. Pumicing attachments should be damp when used to prevent burning of the acrylic.

A large, fluffy rag wheel is very effective on denture flanges and peripheral rolls. Felt cones, small mandrel mounted rag wheels, soft bristle brushes, and a short length of surgical tubing are good for pumicing the palate and lingual denture flange. Wood centered brush wheels, prophylaxis cups, and soft bristle brushes are very effective for pumicing gingival margins and interproximal areas.

These attachments can be used in any combination. Find a pumicing method that suits your needs. There is no standard lathe speed; it's a matter of personal preference. Just remember to use plenty of pumice to ensure a smooth polish. Some safety reminders include placing the piece against the wheel at approximately a five o'clock position; keeping the guard in place; and wearing a face shield.

Rinse the pumice from the denture and dry it. Inspect the denture base for rough spots and re-pumice if necessary. Finally, polish the denture with commercially prepared polishing compounds. You want to achieve a high gloss polish to prevent plaque accumulation and prevent irritation to the patient's mouth. Some polishing compounds are capable of achieving this degree of shine in a one step process. However, if you do not have this type of compound, use tripoli and a chalk compound. Use a separate set of polishing attachments for each polishing compound. Impregnate the wheels and brushes with the compounds before use. Polish around the teeth with tripoli. Then, polish the denture base with a fluffy rag wheel and tripoli. Use a smaller wheel for tight spots. The denture should be dry when applying tripoli. Do not touch the teeth at this time.

Clean the tripoli from the denture in an ammoniated detergent in the ultrasonic. Rinse the denture, and while it is wet, apply the chalk compound. Be careful not to place too much compound on this

wheel since it could cause the denture to appear dull. If this happens, wash the denture and redo the chalk application. Thoroughly remove the final compound in the ultrasonic and disinfect the denture.

Store the denture in an air-tight bag with approximately one teaspoon of water. The denture should be kept in a humid atmosphere rather than total immersion. It has been shown that acrylic resin absorbs liquids when stored for long periods under water. This causes dimensional changes. Also, the denture should not be allowed to dry out to prevent dimensional changes.

418. Procedures for servicing dentures

In addition to fabricating new prosthodontic appliances, the dental clinic also services existing appliances. As with the original fabrication, the bulk of the work is usually done in the dental laboratory. You'll begin your study of these procedures with repairing dentures followed by relining and rebasing dentures.

Repairing dentures

Both complete and partial dentures will require repairs one time or another. The dental laboratory is able to make many kinds of repairs like the following:

- Replace fractured or missing artificial teeth.
- Mend fractures of the acrylic denture base material.
- Repair clasps and rests.
- Repair major and minor connectors of metal frameworks.

Some repairs are made in the laboratory without an impression, while others require an impression. Impressions are not usually needed if an anterior or posterior tooth is to be replaced or if the pieces of the fractured denture base material fit firmly and unmistakably into their original position. If denture base material is fractured to the extent that it is difficult to establish the exact original relationship of the material, an impression of that single arch usually is taken. An impression permits repair to be made on an accurate cast of the patient's mouth. The dentist will tell you what type of impression material and tray is needed for each case. Complete a DD Form 2322 for the requested work and coordinate a date and time for completion of the repair. When the laboratory returns the repaired denture, the dentist will insert the denture into the patient's mouth and check the denture fit and occlusion. If necessary, the dentist will make adjustments.

Relining and rebasing dentures

After a patient wears a complete or partial denture for a period of time, it's common for the edentulous ridge to undergo a generalized reduction in size. Shrinkage results from the initial healing of ridges with immediate dentures. Later reduction occurs in response to excessive force being placed on the dentures. Whatever the cause of edentulous ridge reduction, the results are the same. The patient's vertical dimension of occlusion can show progressive overclosure or the denture becomes loose. To correct these conditions without remaking the entire denture, the dentist will reline or rebase the denture.

Relining

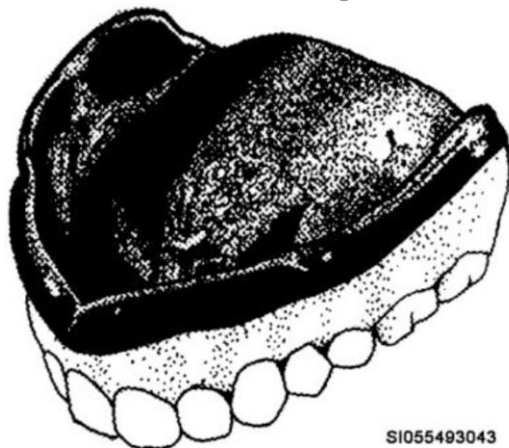
A reline is the process of resurfacing the tissue side of a denture with new base material to make the denture fit more accurately. There are two types of relines for removable dentures: the chairside reline and the laboratory reline. A chairside reline resurfaces the tissue side of a complete or removable partial denture with new base material, tissue conditioning material, or other interim lining. A laboratory reline resurfaces the tissue side of a complete or removable partial denture with a laboratory processed material.

Sometimes the patient's ridges are in poor health from the trauma of ill-fitting dentures. This causes the patient's tissue to be inflamed, enlarged, or deformed. To heal and return the tissue to normal size, the dentist will perform a chairside reline with a soft, tissue-conditioning material. This lining

material is temporary and can be easily removed and reapplied several times. The material is supplied in a powder and liquid form that you mix according to the manufacturer's instructions. Either you or the dentist will place the material on the tissue side of the denture and then seat the denture in the patient's mouth. When the material has set, remove the denture from the patient's mouth. Use scissors and a sharp compound knife to trim any excess material that flowed over the denture edges onto the polished surface of the denture. The patient will wear this temporary soft lining while the tissue heals. In some situations, the liner must be replaced periodically as the tissue shrinks to its normal size. When the tissue is completely healed, the dentist can permanently reline the denture.

When the dentist desires to add a new acrylic lining to a denture as a chairside procedure, the entire procedure can be accomplished in one appointment. The advantage of the chairside reline is that the patient does not have to be without a denture for any period of time. First, have the patient remove his or her dentures. Then clean and disinfect them according to proper infection control standards. Next, the dentist will relieve or roughen the tissue side of the denture or adjust the edges. You will need to have acrylic burs and stones available for the dentist to accomplish this part of the procedure. When the dentist completes this part of the procedure, apply a lubricant to the patient's teeth and polished surface of the denture. This prevents the cured lining material from sticking to these areas. Next, dispense and mix the relining material according to the manufacturer's instruction. Apply the lining material to the entire tissue surface of the denture base. The dentist then will seat the denture into the patient's mouth and have the patient repeat movements used in border molding. After two to three minutes, the dentist will remove the denture from the patient's mouth. This is necessary to prevent the patient's tissues from burning from heat generated by the self-curing acrylic. Once removed, the denture is placed in a bowl of warm water for 10 minutes to allow further curing of the acrylic. Some dentists prefer to have the denture processed in a pressure cooker in the dental laboratory. After hardening, the dentist or laboratory will trim the excess acrylic away and polish the denture. The dentist will insert the relined denture and make the needed adjustments.

If the dentist performs a laboratory reline, two appointments are required. When arranging these appointments, inform patients that they'll be without their dentures for at least 8 to 24 hours while the laboratory processes the dentures. At the first appointment, have the patient remove his or her dentures. Then, clean and disinfect them before beginning the reline procedure. The dentist will relieve the undercuts on the tissue side of the denture and reduce the edges with acrylic burs and stones. Then, the dentist will use the denture as a custom tray to make the impression of the edentulous ridge (fig. 2-14). You will then paint the tissue side of the prepared denture with an appropriate tray adhesive and prepare the impression material. Usually, the dentist will select a rubber-base or silicone-base impression material. However, some dentists prefer to use tissue conditioning material for the impression. After you prepare the impression material according to the manufacturer's instructions, place the material into the denture, covering the tissue side of the



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Figure 2-14. Reline impression in a denture.

denture. Make sure that you have no excess material to reduce the possibility of gagging the patient. The dentist will insert and position the denture properly in the patient's mouth. The dentist will repeat the border molding movements and instruct the patient to close his or her teeth gently in occlusion. The patient will continue to hold his or her teeth in centric occlusion and the mandible in centric relation while the impression material sets. After the material has set, the dentist will remove the denture. Clean and disinfect the impression according to current infection control standards. Deliver the combined denture impression-jaw relationship record and a completed DD Form 2322 to the dental laboratory.

Coordinate a date and time with the laboratory for completion of the reline. Before dismissing the patient, arrange the second appointment for delivery of the relined denture. At the second appointment, the dentist will deliver the denture in the same manner as new dentures.

Rebasing

If the base material of a denture is discolored after years of use, or if the denture has been repaired several times, the dentist may decide to duplicate (rebase) the denture base. Rebasing a complete or removable partial denture replaces all of the denture base material with new laboratory processed material without changing the occlusal relationship. Rebasing is not done often because acrylic teeth in most old dentures show advanced wear and are not serviceable. However, rebasing an old denture is a great deal quicker than making a new denture. Rebasing is the treatment of choice when the time factor is important or when the teeth are in good condition. A rebased denture also serves as the perfect temporary prosthesis while a new denture is being fabricated.

The rebasing procedure involves refitting the denture using a corrective impression as in a reline procedure. When the laboratory returns the denture to the dentist for insertion, the procedures for delivery to the patient are similar to inserting a new denture.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

414. Evaluation, preliminary impressions, border mold, and final impression procedures

1. What two procedures are done at the first appointment for complete denture fabrication?
2. What instruments, equipment, and materials will you need to have ready for this appointment?
3. After you seat, drape, and position a complete denture patient, what must you do next to prepare the patient?
4. What coordination and instructions must you accomplish with the dental laboratory at this appointment?
5. If possible, how should you arrange appointments for complete denture fabrication?
6. What must you retrieve from the dental laboratory prior to the patient's next complete denture appointment (the second appointment)?
7. What procedures take place at the second appointment for complete denture fabrication?

8. What materials are used in a custom tray when doing a complete denture fabrication?
9. What items do you need to have available and ready for border molding and final impression procedures?
10. What does the dentist use to adjust the borders of the tray to the proper length?
11. Briefly describe how the dentist border molds the tray to record the proper peripheral border anatomy of the patient's mouth.
12. What does the dentist use to trim any excess compound from the custom tray?
13. When do you paint the tray adhesive onto the custom tray?
14. What type of impression material is usually used to make a final impression for complete denture fabrication?
15. How should the impression tray be loaded with impression material?
16. Why is it important not to overload the impression tray?
17. After the dentist places the impression tray into the patient's mouth, what can be done to prevent the patient from swallowing unnecessarily and causing a gag reflex?
18. How is any excess material from the impression tray removed from the patient's mouth?
19. What coordination is necessary with the dental laboratory following the final impression?
20. What does the dental laboratory technician fabricate with the final impression?

21. What is a record base or baseplate?
22. What is an occlusion rim or bite rim?
23. How does the dentist use the record base and bite rim at the next appointment?

415. Jaw relation records and denture tooth selection for complete dentures

1. List three procedures that are done at the third appointment for complete denture fabrication.
2. What tools and materials will you need to have available and ready for the jaw relation records and denture tooth selection procedures?
3. What is centric occlusion?
4. Define vertical dimension.
5. What term means the vertical distance between the upper and lower jaws when natural teeth or denture teeth are in MI?
6. Define the term physiologic rest vertical dimension.
7. How does the VDO compare to the physiologic rest measurement in most people with a natural dentition?
8. What is the purpose of a making a face-bow transfer?
9. What is the heated face-bow fork fused to?
10. What references must be marked on the surface of the patient's skin?

11. List only the steps required to attach the face-bow fork to the face-bow.
12. What type of denture teeth sets are available commercially?
13. How many teeth are in a set?
14. How many teeth make a full complement of denture teeth? Why that number?
15. What is the primary factor in selecting anterior denture teeth?
16. What term refers to personalized alterations to the size, shape, and color of the teeth in the set?
17. Define the term denture tooth arrangement.
18. What does the denture tooth size include?
19. To what does the tooth shape or mold relate?
20. What device does the dentist use to select the color of the denture teeth?
21. What does the dentist use to select mandibular anterior denture teeth?
22. Where is the emphasis placed when selecting posterior denture teeth?
23. What does posterior denture tooth shape refer to?
24. Why does the dentist tend to choose a posterior denture tooth shade one shade darker than the anterior shade selected?

25. On what form must the denture tooth shade and mold be recorded?
26. What does the dentist use the record base with occlusion rim for after the laboratory mounts the maxillary master cast? How is this done?
27. How does the dentist indicate the length of the incisor teeth?
28. Why does the dentist scribe marks on the occlusion rims?
29. What does the midline mark represent?
30. What does the high lip line mark on the maxillary rim indicate?
31. What is the distance between the cuspid lines used to select?
32. How does the dentist estimate VDO?
33. When does open VDO occur?
34. What are some of the more common symptoms associated with an open VDO?
35. What occurs with a closed VDO?
36. What are clues that VDO exists?
37. At what point with the occlusion rims does the dentist usually start the procedure to determine the VDO? How is this determined?

38. How does the dentist determine the correct VDO is reached?
39. After estimating the correct VDO, how does the dentist make a combined VDO and centric relation record?
40. What coordination must you complete at the end of the third appointment for complete denture fabrication?
41. What does the dental laboratory technician use the record bases for after completion of the third appointment?

416. Try-in of complete denture wax setup

1. What is the purpose of the fourth appointment for complete denture fabrication?
2. What items will you need for the try-in appointment?
3. List the esthetics items the dentist checks on the wax trial dentures.
4. List the three functional items the dentist checks on the wax trial dentures.
5. After adjustments or corrections are made to the trial wax dentures, what should you provide to the patient?
6. List the things you need to do after the dentist and patient approve the trial dentures.
7. List the laboratory work required to finish the fabrication of complete dentures.

417. Insertion and post insertion adjustments for complete dentures

1. What treatment is provided at the fifth appointment for complete denture fabrication?

2. What items will you need to have available and ready?
3. Explain how pressure indicator paste is used.
4. Besides checking and adjusting the tissue side of the denture and occlusion what else does the dentist do?
5. How does the dentist refine the occlusion and articulation of the denture teeth?
6. What is done to the dentures after all adjustments are made?
7. How often and how should the patient remove and clean his or her denture?
8. What should the patient do with the denture when it is not being worn?
9. Why is it necessary for the patient to remove his or her denture from his or her mouth for several hours during each 24-hour period?
10. How soon after insertion should the patient be seen for post insertion adjustments?
11. Why is it important to make post insertion adjustments as soon as possible?
12. What items are needed for the complete denture post insertion appointment?
13. How does the dentist use an indelible pencil or disposable indelible to identify the location of a sore spot on the denture?
14. Why is the denture polished to a high gloss?

418. Procedures for servicing dentures

1. What type of denture repairs does the dental laboratory make?
2. When is an impression usually required to make the repair?
3. What administrative tasks must you complete for denture repairs?
4. For what reasons are dentures relined or rebased?
5. What is a reline?
6. Explain the two types of relines.
7. When is tissue conditioning material used?
8. Briefly explain how to apply the tissue conditioning material?
9. What is an advantage of a chairside reline?
10. Briefly describe the sequence to prepare the patient and denture for a chairside reline procedure.
11. What is the treatment sequence of a denture reline after the relining material is mixed?
12. How many appointments are necessary for a laboratory reline? What must you tell your patients when arranging these appointments?
13. During the laboratory reline, what does the dentist use as a custom tray to make the impression of the edentulous ridge? How is this item prepared?

14. What does rebasing a denture replace?

15. When is rebasing the treatment of choice?

2-3. Removable Partial Denture Procedures

Just as the fabrication of complete dentures, removable partial dentures are also fabricated using a series of steps the dentist, assistant, and laboratory technician perform as a team. Each step must be performed accurately and precisely. You'll study the series of appointments necessary to provide treatment and the major steps in removable partial denture (RPD) construction.

419. Evaluation, preliminary impressions, survey and design procedures for RPD

You as the assistant must understand the steps to the delivery process of the partial denture in order to help the patient understand the commitment required on his or her part. An RPD fabrication usually requires five appointments before the prosthesis is delivered.

Evaluation and preliminary impressions for removable partial dentures

At the first appointment for RPD fabrication, the dentist begins with the standard prosthodontic evaluation. Before the patient arrives, have the following items available and/or setup on the bracket tray.

- Mouth mirror.
- Explorer.
- Periodontal probe.
- Cotton forceps.
- Impression material.
- Powder scoop.
- Water measure.
- Spatula.
- Mixing bowl.
- Stock trays.
- Utility wax ropes.

Seat, drape, and position the patient in the dental treatment chair. Have the patient remove any existing dentures and place them in a container of water.

The dentist will perform a complete oral and radiographic examination and evaluate the patient's oral condition, form a diagnosis, and determine a treatment plan. The dentist will conclude what, if any, restorative procedures, periodontal treatment, or oral surgery is required prior to RPD. If this is the case, the patient will require additional appointments.

During evaluation, either you or the dentist will make maxillary and mandibular preliminary impressions for study or diagnostic casts. Since the average partially edentulous dental arch has many deep undercuts around the remaining teeth and the alveolar ridges, elastic impression material is preferred to make preliminary impressions for removable partial dentures. One type of material commonly used is alginate. Follow the manufacturer's instructions to prepare the impression material.

You'll also initiate and record information on DD Form 2322 as previously discussed. Remember to request and coordinate with the laboratory on the fabrication of any items needed to perform chairside procedures involved in fabricating the RPD. Indicate the items, date, and time of the patient's next scheduled appointment on the DD Form 2322. Before transporting the preliminary impressions to the dental laboratory with the DD Form 2322, clean and disinfect them according to the recommended infection control standards. Confirm the date and time of the next appointment with the patient before dismissal.

In the dental laboratory, the impressions are poured to fabricate diagnostic casts. The casts and any other items requested for fabrication of the RPD are placed into a metal prosthetic case pan along with the DD Form 2322. Before the patient's next appointment, retrieve the case pan and ensure the items requested have been fabricated by the laboratory. The dentist will use the diagnostic casts for further evaluation of the patient's dental problems, and preliminary survey and design.

Survey and design of removable partial dentures

Before the patient's next appointment, the dentist will survey the diagnostic casts and draw a tentative RPD design on the cast as shown in figure 2-15. During the survey and design procedure, the dentist will decide on the design of the appliance, location of undercuts, clasp positions, and rest preparations. At the patient's second appointment, the dentist will use the diagnostic cast as a visual aid to make rest preparations in the teeth and any other necessary contour modifications. Although survey and design of RPDs are not chairside procedures, it's an important procedure that must be completed before patient treatment can progress. To help you understand the complexity of RPDs and the importance of the survey and design procedure, you'll be studying some of the basic requirements and components of RPDs, and a little about the survey and design procedure.

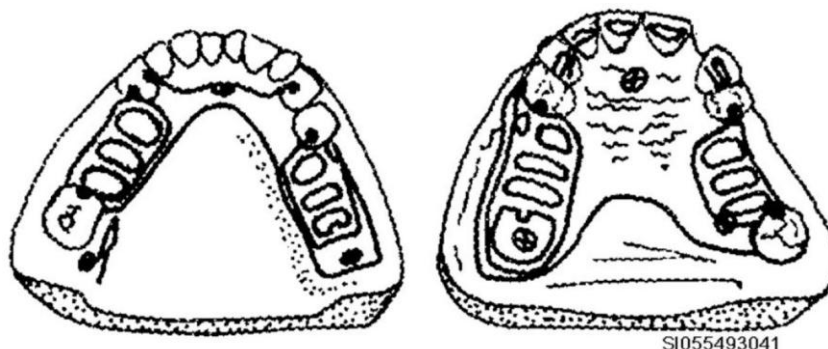


Figure 2-15. Diagnostic casts surveyed and designed.

Requirements of removable partial dentures

If an RPD is to serve its purpose, it must stay in place, in the mouth. The various RPD parts must not irritate the tissues that they cover within the mouth. Also, any shifting movements of the RPD from front to back or from side to side should be restricted as much as possible. RPDs are retained, supported, and braced by the remaining natural teeth.

Components of removable partial dentures

The basic components in the design of the RPD (fig. 2-16) consist of:

Component	Definition
Framework	Metal substructure that provides a basic support for the connectors and saddle of the RPD.
Bar or lingual plate	A major connector that joins one part of the RPD to another.
Saddle	The portion of the appliance that covers the oral mucosa of the alveolar ridge and retains the artificial teeth.

Component	Definition
Rest seats or rest preparations	Before an impression for RPD construction is made, the dentist cuts special depressions into the abutment teeth in contact with properly contoured rest seats. Rest and rest seats prevent the RPD from being jammed gingivally into the tissue of the mouth.
Abutment tooth	A natural tooth specifically used to retain, support, or stabilize an RPD.
Rest	The metal projection on or near the clasp of an RPD. The rest controls the extent that the RPD is seated when inserted into the mouth and placed on the teeth. It also prevents abnormal wear to the abutment teeth and injury to the oral mucosa during mastication. Rests are designed to lie in a prepared recess on the occlusal surface, lingual surface, or incisal edge of a tooth.
Clasp	A part of an RPD that acts as a retainer. It helps support and provides stability by partially encircling and contacting an abutment tooth. Clasps are designed to be flexible and retain their position at the undercut area of the tooth crown. They must also be resilient to enable the RPD to be removed and reinserted by the patient. Clasps are the most commonly used means of retention.

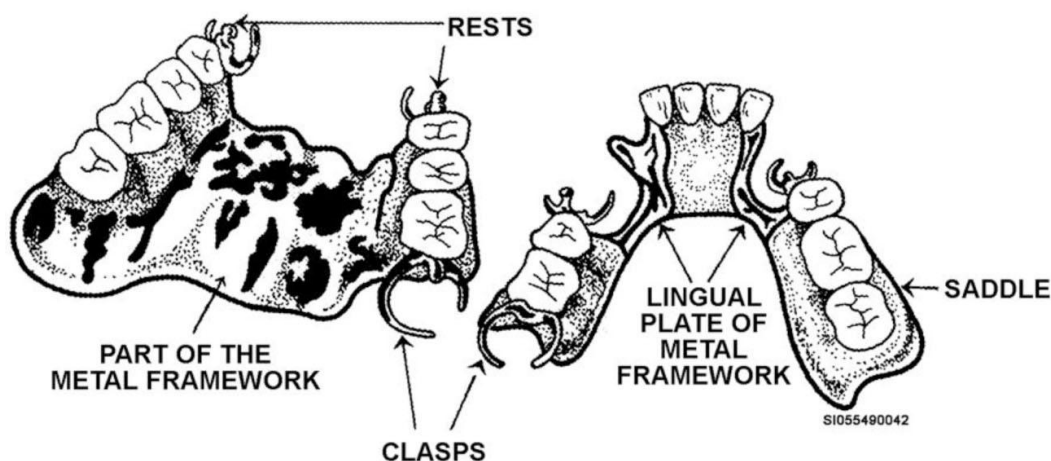


Figure 2-16. Components of removable partial dentures.

Survey and design procedure

This procedure can be performed in the laboratory or DTR. If the dentist chooses to survey and design casts in the DTR, you'll need to get the case pan with the diagnostic casts and an instrument known as a surveyor from the laboratory. The dentist will use the surveyor to draw a contour map on the teeth and tissue areas of a cast so the helpful features can be used and the undesirable ones minimized in the design. The survey procedure consists of analyzing a cast to select the most favorable path of insertion (the direction of travel the proposed RPD takes when going to place). It also includes marking cast features, such as abutment tooth undercuts, necessary for retention. An undercut is the portion of a tooth that is cervical to the survey line. The amount of undercut usually increases from the survey line cervically. The dentist measures undercut with an undercut gauge mounted in the surveyor. The survey procedure also marks cast features, such as the heights of contour of the remaining natural teeth and soft tissue.

The design procedure involves making selections among various components using the survey procedure as a basis for choice and drawing the design on the cast.

420. Preparation and final impression for removable partial dentures

At the second appointment, the dentist uses the survey lines and other marks on the diagnostic cast as a guide to make the rest preparations in the teeth used as abutments and modify to the shapes or

contours of the teeth in the patient's mouth. Proper contouring of teeth where the metal framework rests is an important part of mouth preparation. The dentist must contour the occlusal surfaces of the teeth that will support the framework to hold the framework firmly in place and allow clearance between the maxillary and mandibular teeth to accommodate the thickness of the framework. The buccal and lingual contours of the abutment must allow the denture to be inserted and removed without binding and held in place by clasps.

For this portion of the treatment, you'll need to have the following items ready:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Articulating paper and holder.
- High volume suction tip.
- High-speed handpiece.
- Low-speed handpiece with latch attachment.
- Variety of burs, stones, and points.
- Case pan with the surveyed diagnostic casts and DD Form 2322.

During the procedure, you'll irrigate and aspirate with the air-water syringe and high volume suction. After the dentist recontours the undercuts and prepares the rest seats on the abutment teeth, you will clean and polish the patient's teeth to remove any debris before the final impressions are made. You'll need the following additional items for this procedure:

- Scalers.
- Curettes.
- Low-speed handpiece with prophyl angle attachment.
- Rubber polishing cup.
- Pumice.
- Saliva ejector.

After the patient's teeth are cleaned and polished, the dentist will make a final impression to produce a master cast. Most dentists use alginate impression material and stock trays for this purpose and others use custom trays. If the dentist prefers to use custom trays, request them on the DD Form 2322 when the preliminary impressions are made. You'll need the following items for this part of the treatment:

- Impression material.
- Powder scoop.
- Water measure.
- Spatula.
- Mixing bowl.
- Custom or stock trays.
- Utility wax ropes.
- Tray adhesive.

Next, prepare the impression material according to the manufacturer's instructions, place it in the impression tray, and hand the filled tray to the dentist to seat in the patient's mouth. After the impression material sets, the dentist will remove the impression from the patient's mouth. Before taking the impressions to the laboratory to be poured and trimmed, you need to clean and disinfect

them according to current infection control standards. Pouring a final impression to make a master cast is one of the most crucial steps in RPD fabrication. A master cast has to be a precise, positive duplicate of the patient's dental structures from which a prosthesis can be made. To achieve this, alginate impressions must be poured within 10 minutes after being removed from the patient's mouth. Therefore, always coordinate with the laboratory in advance whenever the dentist will be making alginate final impressions for RPD fabrication.

When you transport the impressions to the laboratory, take the DD Form 2322 along. Also, record any necessary annotations on the form. If necessary, the dentist will make an occlusal or bite registration before concluding the treatment. Normally, you'll not arrange the next appointment with the patient until the RPD framework is ready. Before dismissing the patient, verify the patient's telephone number so you can contact and arrange the next appointment.

Most local base laboratory personnel do not make metal RPD frameworks. They send the surveyed and designed diagnostic cast along with a master cast and DD Form 2322 to an area dental laboratory (ADL) for framework fabrication. After the actual framework is cast, finished, and polished, the ADL will return a copy of the DD Form 2322, diagnostic casts, duplicate master casts, and RPD framework seated on the master cast to the original laboratory.

421. Procedures for framework try-in, and insertion and post insertion adjustments

After your local laboratory receives the finished framework from the ADL, contact the patient and arrange the next appointment. The third appointment is to try-in the framework, and establish and record the relationship between the maxillary and mandibular arches, if needed.

Removable partial denture framework try-in

You'll need to have the following items for the procedure:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Contouring pliers.
- Disclosing wax.
- Wax spatula.
- Bunsen burner.
- Handpiece.
- Small rotary stones of various shapes and sizes.
- Shade guide.
- Articulating paper and holder.
- Entire case pan with the framework, casts, and DD Form 2322.

During this appointment, the dentist checks the fit of the framework, retention, and position of the clasps, and the path of insertion. The dentist uses the contouring pliers to make adjustments to the clasps. The dentist may have you melt the disclosing wax and place it on the tissue side in specific areas of the metal framework. When the dentist seats the framework in the patient's mouth, markings are made in the waxed areas that require adjustments for proper fitting. The dentist will also check and adjust the occlusion of the RPD frame against the opposing natural teeth using the articulating paper. The dentist will make the necessary adjustments to the framework and occlusion using the handpiece and rotary stones.

In some situations, the dentist needs record bases and occlusion rims for a jaw relationship record procedure. These are not usually necessary in cases where enough natural teeth are present to locate a reproducible centric occlusion. If the dentist determines that occlusion rims are needed to relate the

lower cast to the upper, the occlusion rims ordinarily are attached directly to the adjusted RPD framework. Coordinate with the laboratory when the dentist needs occlusion rims. The dentist may need only to make a bite registration. A variety of materials are available to make bite registrations. Be familiar with the material your dentist prefers to use.

During this third appointment, the dentist will select the shade and mold of the artificial teeth and tries to select teeth that blend with the shade and mold (shape) of the remaining natural teeth. If so few natural teeth remain that the only information they provide is basic shade, tooth selection considerations are the same as those for complete dentures. Record the shade and mold the dentist selects on the DD Form 2322. Return the case (casts, framework, DD Form 2322, etc.) to the laboratory and coordinate a completion date for delivery of the appliance to the patient. The dental laboratory must have enough time to set the artificial teeth, wax the denture bases, and process the resin (flask, boil out, pack, and process). Before dismissing the patient, arrange the next appointment for delivery.

Insertion and post-insertion adjustments

The last two appointments for RPD construction are for insertion (delivery to the patient) and post insertion adjustments.

Insertion

The purpose of the fourth appointment is to insert the completed removable partial denture and make the necessary adjustments to the clasps and occlusion. Before the patient arrives, get the RPD from the laboratory. You'll also need to have the following items available:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Pressure indicator paste.
- Disposable brush.
- Handpiece.
- Burs, stones, and points.
- Articulating paper and holder.
- Assorted pliers.
- Hand mirror.

Apply a light coat of pressure indicator paste to the tissue side of the dried, denture acrylic area with the brush. Now, the dentist will insert the denture into the patient's mouth, and when removed, excessive pressure will leave a bare spot on the denture that shows the point where pressure was exerted. The dentist relieves these areas on the dentures with the handpiece. The dentist will also check the edges of the dentures and make any necessary adjustments. The dentist uses assorted pliers to adjust the clasps for retention and removal, if needed. Next, the dentist will refine the occlusion and articulation of the denture teeth with articulating paper and stones in the handpiece. After all adjustments are made, the dentures are returned to the laboratory for a final polishing. After the laboratory has polished the dentures, scrub them carefully with soap and water before returning them to the dentist for final delivery.

Instructions for the proper care and wearing of RPDs are similar to complete dentures. Because the RPD is retained by clasps, either you or the dentist must give the patient instructions in the proper insertion and removal method. After you or the dentist demonstrate inserting and removing the RPD in the patient's mouth, make sure the patient can do this without assistance. Instruct the patient to remove the denture and thoroughly clean all denture surfaces daily. Recommend the patients use a special denture brush for this purpose. Tell your patients to thoroughly rinse the oral tissues of their

mouth while their dentures are not in their mouth. Instruct patients to keep their dentures moist when not being worn to avoid warpage of the acrylic. Advise patients to remove their dentures from their mouth for several hours during each 24-hour period. Before dismissing a patient, arrange an appointment for post insertion adjustments for the next day.

Post insertion adjustments

It may take the patient several days to a week to fully adjust to wearing new dentures. The patient can develop areas of irritation or denture sores where the denture overextends or presses too hard on the tissue. To prevent sore spots from occurring, the dentist needs to see the patient the day after insertion of the dentures. Arrange the fifth appointment for the next day, at which time the dentist will relieve acrylic areas on the denture, adjust the clasps, and make occlusion adjustments. Have the following items available for this appointment:

- Mouth mirror.
- Explorer.
- Cotton forceps.
- Assorted pliers for any adjustments necessary to the clasps.
- Pressure indicating paste.
- Disposable brush.
- Indelible pencil or disposable indelible marker.
- Articulating paper and holder.
- Selection of stones and burs for use in the handpiece.

Pressure indicating paste is used in the same manner at the post insertion adjustment appointment as at the insertion appointment. Sometimes, the dentist may prefer to use an indelible pencil or disposable indelible marker to mark the sore spot in a patient's mouth. The dentist will then place the dentures into the patient's mouth to transfer the marking onto the tissue side of the denture. The dentist uses selected burs and stones to relieve the areas on the acrylic. Next, the dentist makes any occlusion adjustments necessary. After the dentist finishes making all of the adjustments, you need to disinfect the dentures and take them to the laboratory for a final polish of the adjusted areas. All acrylic areas on the periphery (edges) of a denture should be polished to a high surface gloss so that it will not irritate the patient's mouth. Areas on the tissue side of dentures are smoothed with a soft rubber abrasive wheel or point, but should not be polished like the periphery areas. Any metal surfaces adjusted, except clasp adjustments, should be smoothed and polished to prevent irritation to the soft tissue. If necessary, schedule the patient for additional adjustments.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

419. Evaluation, preliminary impressions, survey and design procedures for RPD

1. What is done at the first appointment for RPD fabrication? What does this include?
2. What instruments and materials are needed at the first appointment?
3. What type of impression material is commonly used to make study casts for RPD fabrication?

4. What form must you use to initiate and record information to request laboratory work for RPD fabrication?
5. What are the casts and any other items requested for fabrication of the RPD stored in?
6. What does the dentist do with the study casts before the patient's next appointment?
7. Explain how the dentist uses the diagnostic cast at the patient's next appointment.
8. What is an RPD framework?
9. What is a bar or lingual plate on an RPD?
10. What is the saddle portion of an RPD?
11. What prevents the RPD from being jammed gingivally into the tissue of the mouth?
12. What is an abutment tooth?
13. What are rests? Where are rests designed to lie?
14. What is a clasp on an RPD? What is its function?
15. What items will you need to get if the dentist chooses to survey and design casts in the DTR?
16. Why does the dentist use a surveyor?

420. Preparation and final impression for removable partial dentures

1. Briefly explain what takes place at the second appointment for RPD fabrication.
2. What areas of the teeth does the dentist contour and why?
3. What items will you need for preparation and recontouring procedures?
4. What additional items will you need to clean and polish the patient's teeth after the dentist recontours the undercuts and prepares the rests seats?
5. What type of impression material and trays do most dentists use to make the final impression for RPD fabrication?
6. What items will you need to have ready for the final impression procedure?
7. Why is it necessary that you always coordinate with the laboratory in advance whenever the dentist will make alginate final impressions for RPD fabrication?
8. When do you normally arrange the next appointment with the patient following preparation and final impression?
9. Where are the metal RPD frameworks made? What items must be sent for fabrication of the framework?
10. What items does the ADL return to the original laboratory?

421. Procedures for framework try-in, and insertion and post insertion adjustments

1. What is the purpose of the third appointment for RPD fabrication?
2. What items will you need for this procedure?

3. What type of things will the dentist check when trying in the framework?
4. What does the dentist use contouring pliers for at this appointment?
5. Explain what you may be required to do with the disclosing wax and how is the disclosing wax used.
6. What does the dentist check when using articulating paper?
7. What does the dentist use the handpiece and rotary stones for at this appointment?
8. If the dentist determines that occlusion rims are needed, how are they usually done? What must you do when occlusion rims are needed?
9. Where must the shade and mold of the teeth be recorded?
10. What factors must be considered when coordinating a completion date for delivery of the appliance to the patient?
11. What is the purpose of the fourth appointment for RPD fabrication?
12. What items will you need for this appointment?
13. Where will you apply pressure indicator paste and why?
14. What adjustments does the dentist make to the appliance at the insertion appointment, if necessary?
15. What is done with the appliance after the dentist makes all adjustments?

16. Briefly explain the instructions given to the patient at the insertion appointment.
17. What are denture sores and how can they be prevented?
18. What is the purpose of the fifth appointment for RPD fabrication?
19. What items will you need to have available for the post-insertion adjustment appointment?
20. Explain how and why the dentist uses an indelible pencil or disposable indelible marker.
21. What must you do after the dentist finishes making all of the adjustments to the RPD?
22. Explain how the various areas of the adjusted RPD should be polished and why.

2-4. Dental Implants and Special Appliances

Some patients may require the use of dental implants or special maxillofacial appliances. For dental implants, you'll need to be familiar with the basic information regarding patient selection, types of implant devices, of prosthesis, treatment procedures, and maintenance of the implant device. You'll also need to know what some of the special maxillofacial appliances are and how they are used. These special appliances include bite-guards, bite-raisers, obturators, speech bulbs, splints, and custom face masks.

422. Dental implants

Instead of conventional prosthetic treatment, some prosthetic patients are considered as candidates for dental implants. A dental implant is a device that is placed within the tissue of the mandible or maxilla for the purpose of providing support for the replacement of missing teeth. The implant itself basically acts as a root or foundation. The prosthesis, fixed or removable, is the equivalent of the crown portion of the teeth. By combining these two parts, good results in function and esthetics are achieved for patients.

Patient selection

Implant treatment is provided by a team of dentists consisting of properly credentialed prosthodontists, periodontists, and oral and maxillofacial surgeons. The oral surgeon and periodontist perform the surgical portions of the implant treatment, and the prosthodontist performs the prosthetic treatment. Patient selection generally is initiated in prosthodontics and coordinated with the other members of the team.

Before selecting a patient for an implant, a general health history is the most important and revealing aspect of the candidate's evaluation. Patients who exhibit systemic diseases or disorders

(cardiovascular, respiratory, nervous system, etc.) that interfere with their normal daily living patterns should not be considered for dental implants. The dental health history is also of vital importance in the evaluation process. A patient with a history of grinding or clenching should not be considered because of the side to side pressure placed on the appliance. Individuals who have lost their teeth because of periodontal disease or caries may have lost them because of neglect in home care also should not be considered for dental implants. The patient's willingness and ability to provide proper home care is essential when selecting candidates for implant therapy.

Using current radiographs, a team of dentists evaluate the ability of the remaining bone structures to accept implants, and must decide the type of implant to use. The team must also evaluate the condition of the patient's mouth and consider the patient's desires regarding esthetics.

Types of implant devices

There are several types of implants; to include the subperiosteal, endosseous, and the most common osseointegrated cylinder. The subperiosteal implant is surgically placed under the periosteum and onto the alveolar bone. The subperiosteal implant is ideal for a removable complete or partial denture. This is not a free-standing implant. It uses the alveolar ridge as a means of support. To use the subperiosteal implant system, there should be sufficient height of the alveolar ridge to accommodate the framework of the implant. The extensions on the framework protrude through the oral mucosa and serve as attachments to the removable complete or partial denture.

The endosseous implant is set into or penetrates the bone, but does not become fused to the bone. The osseointegrated implant is set into the bone and actually becomes fused with the bone (fig. 2-17). The

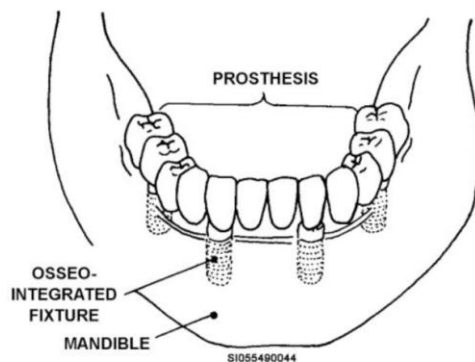


Figure 2-17. Mandibular osseointegrated implant and prosthesis.

osseointegrated implant forms a firm, direct, lasting connection between vital bone and the implant. This technique uses connections constructed of titanium, called fixtures, which are placed directly into the alveolar bone. The titanium fixture is built into the bone through the healing ability of the bone tissue (osseointegration). The material titanium is harmless to human tissue and does not cause any rejection reactions. This forms a basis for permanent anchoring function. A fixed or removable denture is attached to the extensions of the implant that protrude through the oral mucosa. The bone site is prepared and protected to ensure a predictable osseointegrated (bone growth to implant) response. Control of surgical trauma is the key to proper bone healing.

Types of prostheses

There are two basic types of prostheses used with dental implants. The first type consists of fixed appliances that cannot be removed by the patient. Figure 2-18 shows a type of fixed prosthesis. In this figure, view A shows the fixed prosthesis and abutments prior to insertion. View B shows the appliance inserted into the patient's mouth. The other basic type of prostheses is removable dentures.

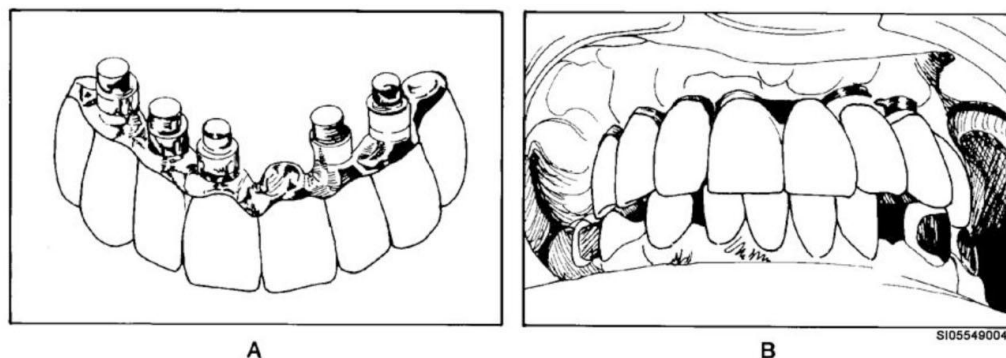


Figure 2-18. Osseointegrated implant fixed prosthesis.

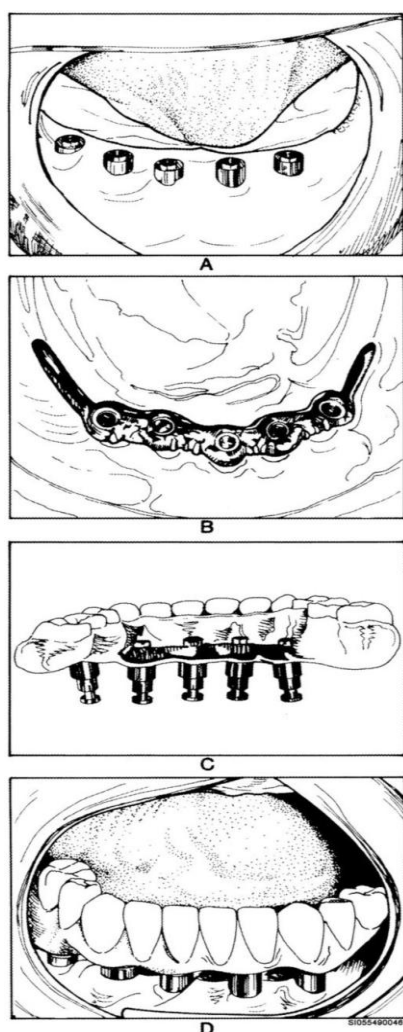


Figure 2-19. Osseointegrated implant and appliance.

been covered by mucosa since stage one. The procedures necessary to fabricate the final prosthesis also begin during stage two. Ideally, the final prosthesis is completed within one to two weeks. However, several weeks to months may be required to complete fabrication and delivery of the

The removable prosthesis can be completely implant supported (fig 2-19) or an overdenture that is both implant and soft tissue supported. In this figure, view A shows the titanium osseointegrated implants. View B shows the metal framework fitted to the implants. View C shows the metal framework with artificial teeth and simulated acrylic tissue added. Finally, view D shows the appliance attached to the implants in the patient's mouth. Figure 2-20 shows a bar device that ties the cylinders together. The denture is hollowed out to engage this bar with one or two clip-type retainers.

Treatment procedures

AF dental facilities primarily utilize the Branemark[®] system of dental implants. Additional systems are evaluated continually for interchangeability, cost effectiveness, and clinical acceptability to meet the needs of our highly mobile patient and provider population.

Figure 2-21 shows the assembly of a Branemark[®] implant device. The typical treatment sequence for the Branemark[®] system is shown in figure 2-22. After evaluation and examination, a treatment plan is presented to the patient. The actual treatment is divided into two stages. In the first stage, separate anchors, called fixtures, of titanium are surgically inserted into the alveolar bone as a foundation for the prosthesis. Usually, 10 to 14 days after the surgery, an interim denture is inserted. The interim denture is worn during the healing period of three to six months.

The second stage begins by connecting the abutments to the fixtures. This procedure requires surgery to expose the fixtures that have

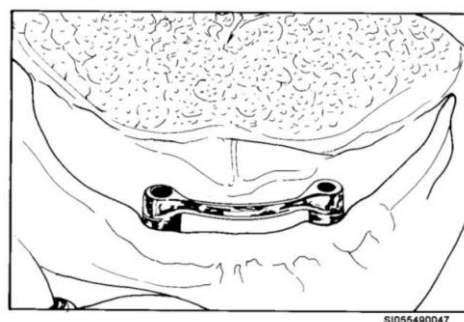


Figure 2-20. Implants with bar device attached.

appliance. In some cases, it's appropriate to make a provisional prosthesis first. This is necessary in order to establish suitable height, form, and color of the teeth. After the patient has worn this appliance for a while, the final prosthesis is fabricated and inserted.

After the osseointegrated appliance has been anchored to the abutments, the oral status is checked regularly. Each patient must be instructed in the special oral hygiene procedures necessary to avoid inflammation in the oral mucosa and alveolar bone. The implant must also be clinically and radiographically checked at regular intervals; therefore, these patients should be recalled quarterly at first. Eventually, the recall appointments may be extended to every six months or once a year.

Maintenance of the implant

Due to the cost for total reconstruction, maintenance of the implant is very important. The healing site should not be disturbed for approximately four to six months. The patient is instructed to rinse with Peridex for control of bacteria until the tissue heals. When the tissue returns to a normal stippled appearance, the patient should clean the posts with a Proxibrush or orange sticks. Once completely healed, the patient's prosthesis is inserted and further instructions on home care are given. Home care instructions to the patient should include the following:

1. Wrap gauze strips or use superfloss to clean around the post and at the base of the denture.
2. Use a water irrigating device (waterpik) as a supplement to the floss.
3. Use a toothbrush with extra long tuft strands with bristles varying in length to brush the denture.

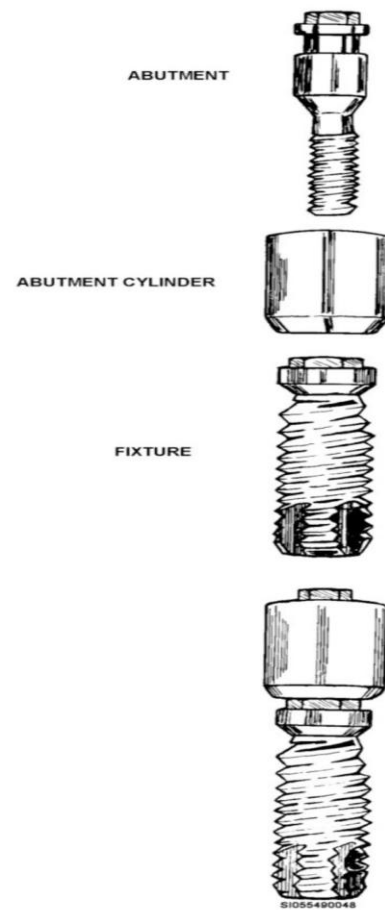


Figure 2-21. Components and assembly of a Branemark® implant device.

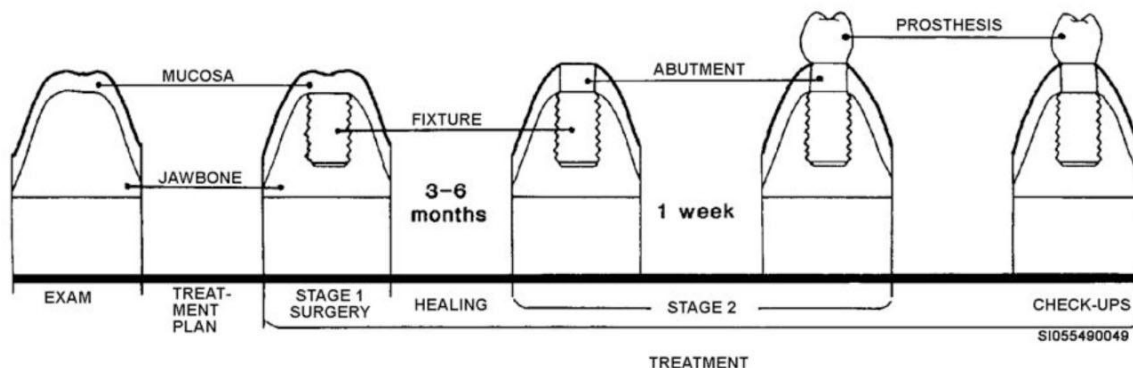


Figure 2-22. Basic treatment sequence for osseointegrated implant logy.

Along with exceptional home care by the patient, professional cleanings are required (usually quarterly) from the time the appliance is inserted. Take extreme care when performing an oral prophylaxis since the denture attaches to a post made of titanium. The use of conventional scalers is prohibited because the mechanical scratches produced will eventually gouge the post. The gouging

will contribute to plaque buildup because the patient cannot clean those very well. The use of disposable Teflon or plastic scalers, prevent the problem of gouging from occurring.

423. Special maxillofacial appliances

Although you've already studied some prosthodontic appliances, you should be aware of other special maxillofacial appliances. These appliances include bite-guards, bite-raisers, palatal obturators, sleep apnea devices, splints, and custom face masks.

Bite-guards

These are orthopedic appliances made of hard acrylic and are designed to cover the incisal and occlusal surfaces of teeth in either the maxillary or mandibular arch. The purpose of this appliance is to stabilize the teeth and provide for unobstructed excursive glides of the mandible. A bite-guard can be used to treat several illnesses that affect occlusion and the temporomandibular joint (TMJ). Disorders associated with the TMJ will improve through the use of such an appliance are:

- Incorrect placement of the condyles in their fossae.
- Muscle spasms.
- Bruxing of the teeth.
- Lack or loss of vertical dimension of occlusion.

Bite-raisers

Bite-raisers are appliances that increase the vertical dimension of the occlusion. This type of prosthodontic appliance generally is used on patients who have gradually lost vertical dimension from wear, loss of teeth, or TMJ problems. Because of the difficulties involved in establishing a balanced occlusion with this type of appliance, it's a common practice to first make a temporary removable appliance of acrylic resin. After the patient has worn the temporary appliance long enough to determine its effectiveness, a permanent appliance is made of metal.

Palatal obturators

To understand the purpose of obturators, you must first learn about the cleft palate. A cleft palate is a defect in the roof of the mouth and nasal cavity. Clefts are confined to the soft palate or include all or part of the hard palate. Palatal clefts extend anteriorly to include clefts of the anterior alveolar ridge. If a cleft is present at birth, it is called congenital. If it is a result of injury, disease, or surgery, it's called an acquired cleft. The most common cleft, the acquired cleft can occur as a postoperative result of head and neck cancer. Today, most congenital cleft palates can be surgically closed. Before taking the final impression for a complete denture fabrication, what does the dentist use to border mold the custom tray?

An obturator is a prosthetic device that closes a congenital or acquired opening in the palate and reestablishes the separation between the nose and mouth. Ideally, the obturator should fully restore the functions of the tissue it replaces, although this is not always possible. The palatal part of the prosthesis should completely close the opening between the mouth and nose so that food taken into the mouth does not run out the patient's nostrils. In addition, the closure should improve speech.

Sleep apnea devices

Obstructive sleep apnea (OSA) is caused when the airflow ceases to pass thorough the upper airway during sleep. OSA is recognized as a common clinical disorder with potentially life threatening consequences. The most accepted explanation of OSA is that the obstruction occurs when the tongue retrudes back against the posterior throat wall. Appliances made to correct this are usually made from acrylic. When the appliance is inserted, it uses the maxillary arch as an anchor to hold the mandible forward. Positioning the mandibular arch forward reduces the contact area for the retruded tongue. This usually prevents recurrence of OSA for the patient.

Splints

A splint is an appliance, either rigid or flexible, used to immobilize displaced or movable parts. In the treatment of certain types of jaw fractures, the oral surgeon first reduces the fracture by bringing the displaced bone segments into normal alignment and fixes them in position by the method best suited to the patient's needs. Later, when healing of the fragments has progressed sufficiently, the fixation apparatus is removed and a splint is inserted. In some instances, the splint serves as the fixation apparatus from the beginning. In addition to their use in treating fractures, splints are sometimes used during periodontal treatment to stabilize mobile teeth temporarily during the healing process. Normally, impressions of both arches are made so that when the splint is made it does not interfere with normal occlusion.

Custom face masks

Some aircrew members who use oxygen masks during flying duties cannot wear the standard sizes because their faces have atypical shapes. These personnel require a custom-fitted mask. The flight surgeon determines when this is necessary and requests the dental facility to fabricate a face form cast. A facial impression must be made to create the face cast. The face form cast must be an accurate reproduction of the face, covering the entire facial area from at least two inches above the eyebrows to at least two inches below the chin and slightly anterior to the tragus of the ear. Detailed step-by-step instructions to make the impression and cast are contained in AFP 47-103, Vol II, *Dental Laboratory Technology, Fixed and Special Prosthodontic and Orthodontic Appliances*.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

422. Dental implants

1. What is a dental implant?
2. What areas of dentistry are involved in implant treatment?
3. What area generally initiates patient selection for a dental implant?
4. Why is a general health history and a dental history important in patient selection for dental implants?
5. What type of implant device is surgically placed under the periosteum and onto the alveolar bone?
6. How does the endosseous implant differ from the osseointegrated implant?
7. What are the connections used with the osseointegrated called? Of what are they constructed?

8. What dental implant system is primarily utilized in AF dental facilities?
9. What treatment is involved in the first stage of treatment?
10. Briefly describe the second stage of treatment.
11. At what intervals should the patient be recalled to clinically and radiographically check the implants?
12. For what period of time should the healing site be undisturbed and what is used to control bacteria until the tissue heals?
13. After the tissue returns to a normal stippled appearance, how should the patient clean the posts?
14. List the home care instruction given to the patient after the prosthesis is inserted.
15. How often are professional cleanings required for the implant patient?
16. What must be avoided when performing an oral prophylaxis? Why?

423. Special maxillofacial appliances

1. What is a bite-guard?
2. What is the purpose of a bite-guard?
3. What disorders associated with the TMJ can be improved through the use of bite-guards?
4. What is a bite-raiser and when is it used?

5. What is a cleft palate?
6. Explain the two terms used to describe the origin of cleft palates.
7. What is the cause of most clefts today?
8. What prosthetic device closes a congenital or acquired opening in the palate and reestablishes the separation between the nose and mouth?
9. What is a splint and when is it used?
10. Who determines when custom face masks are necessary and requests the dental facility to fabricate a face form cast?
11. What is needed to create a face cast?
12. What facial area must be included on the face form cast?

424. Fabricating casts

Even though a dental laboratory technician usually fabricates all casts, there will be times when you will do these tasks. For example, you'll often make casts in the dental treatment room (DTR) for fabricating temporary crowns. This approach is faster and reduces patient treatment time. Also, be prepared to fabricate casts if there are no laboratory technicians available or your dentist tells you to. To fabricate a quality cast, start with a quality impression.

Inspecting impressions

The dentist checks each impression made for adequacy before sending it to the dental laboratory. When you make an impression, with or without supervision, you still have a responsibility to check the impression. Be sure to check it for inaccuracies and ensure that all anatomical structures are reproduced. Occasionally, discrepancies are overlooked and the success of any prostheses fabricated on the resulting cast would be compromised.

Discrepancies

An impression can be distorted or missing vital portions. The impression material may have pulled away from the tray, is too thin or slumped, or has voids, tears, bubbles, or distortions, as seen in figure 2-23. Alginate may pull away from the tray while removing the impression from the mouth. Close

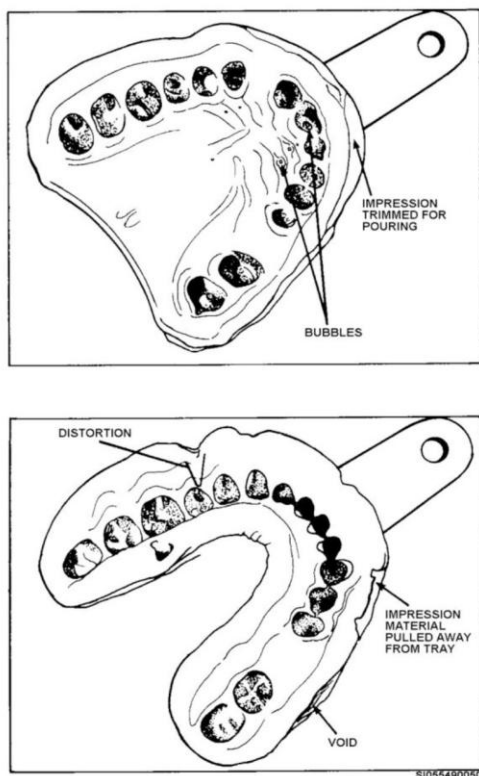


Figure 2-23. Common problems with alginate impressions.

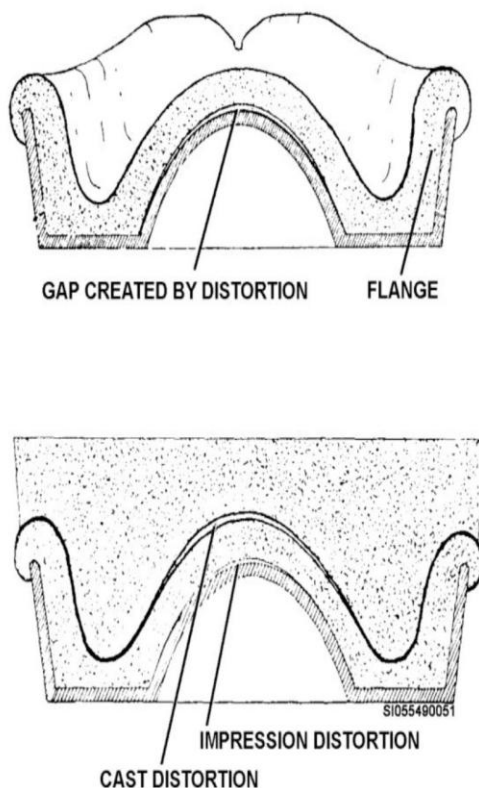


Figure 2-24. Impression and cast distortion caused by thin spots in the impression.

inspection combined with gentle touching of sulcus sections can reveal loose spots. The loose section usually requires retaking the impression.

Thin spots can cause warpage of the impression, as shown in figure 2-24. A fractured cast can also result when the tray and impression are removed from the cast. This problem can be caused by incorrect placement of the tray in the mouth or using a tray that is too small. Slumping of alginate is the opposite problem. Excessive thickness of alginate usually occurs in the palate of a patient with a high vault. As the impression sets, the material collapses in the palate, as you can see in figure 2-25. The impression's palate looks normal, so the problem is undetected until a prosthesis having a palatal base is inserted.

Impression voids and bubbles are caused by mistakes made during the impression procedure. Voids can be created, usually in the sulcus, by moving the impression vertically while it is setting. Bubbles can be caused by an improper mixing technique or leaving excessive moisture on the teeth. V-shaped distortions leading outward from a tooth into the sulcus can be caused by the material beginning to set before inserting in the mouth. Tears are usually found at the posterior border of the tray due to a lack of support. During impression pouring, this tear can create a void by allowing air to enter the liquid stone.

Anatomy

Different types of appliances have different anatomical requirements. A complete denture impression needs a good reproduction of the ridge, sulcus, and posterior border. A fixed partial denture, on the other hand, emphasizes preparation reproduction. Since you are familiar with tooth morphology, we will use a complete denture as an example of an impression-cast-appliance relationship.

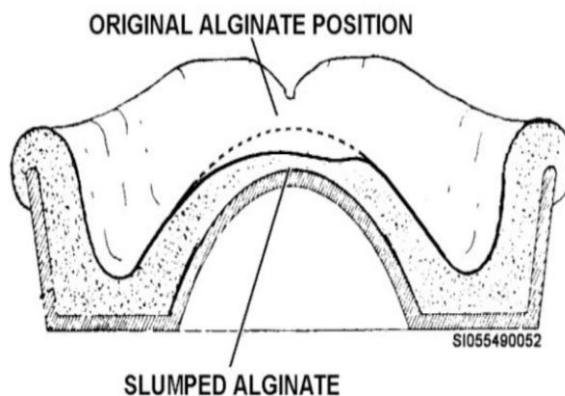


Figure 2-25. Alginate slumping from lack of support.

Figures 2-26 and 2-27 show the landmarks covered here in detail. Notice that the landmarks can be grouped into three categories: (1) those found in both the maxilla and the mandible, (2) those found only in the maxilla, and (3) those found solely in the mandible.

The landmarks common to the maxilla and mandible are:

- The residual ridges.
- The labial frena.
- The buccal frena.

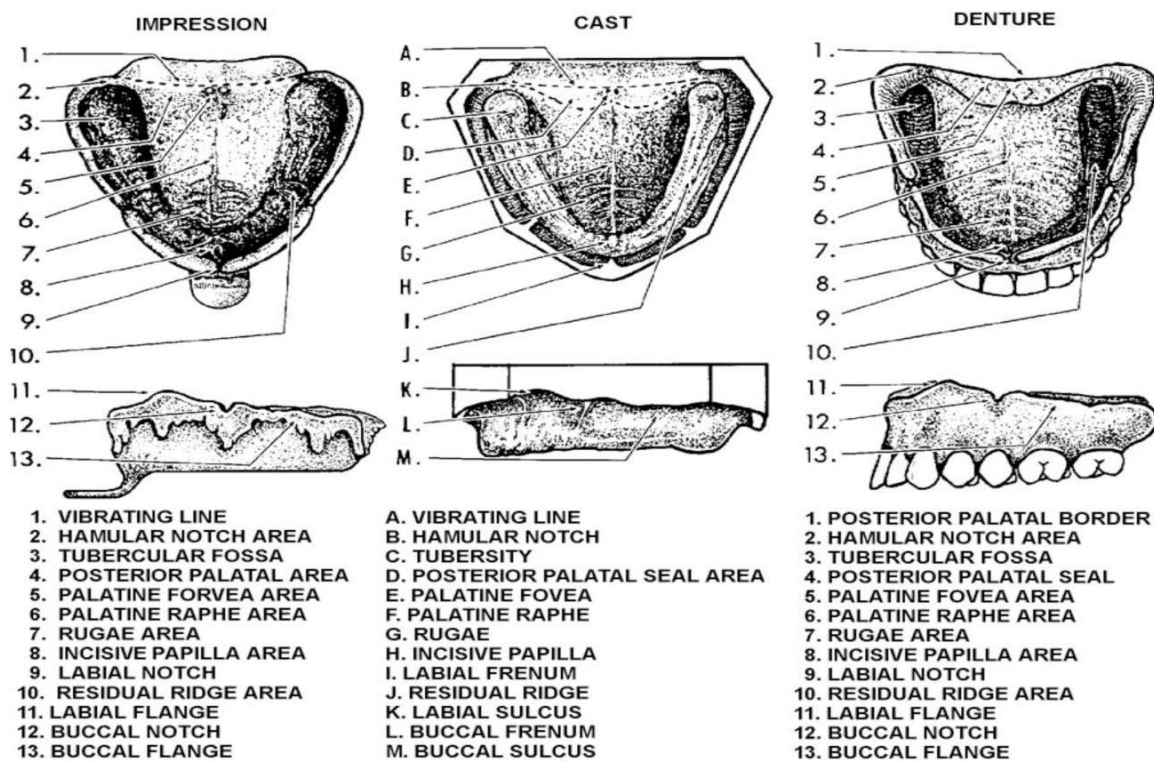
Each of these landmarks is obvious in the mouth, in an impression, and on a cast. All three are extremely important in complete and partial denture construction. Examine them separately.

Look closely at figure 2-26. Residual ridges are the ridges of bone on the maxilla and mandible in which the teeth, if present, are embedded. If the teeth are gone, the mouth is edentulous and the ridges, in general, resemble those shown in figure 2-27. The exact shape of the ridges depends on such factors as the patient's age, oral health, and bone structure. Obviously, a patient's upper residual ridge differs greatly from the lower.

Buccal and labial frena are of great importance because allowances must be made for them in the removable appliances constructed. Otherwise, after the patient wears the appliance for a few hours, the frena becomes sore and the appliance unwearable. Labial frena are two small folds of mucous membrane located at the median line of both the maxilla and mandible. Each extends from the inner surface of the lip to the gingiva and limits, to some extent, the movement of the lip. The attachment of the frena to the gingiva varies. This is especially true of the upper frenum, whose attachment to the gingiva could extend as far down as the gingival border of the teeth. Both the upper and lower labial frena are evident in impressions, making indentations called labial notches.

Buccal frena are found on the right and left sides of the maxilla and mandible, in the buccal region, usually near the premolar teeth. Like the labial frena, the buccal maxillary landmarks of particular importance to you are the fovea palatinae, soft palate, and hamular notch. These three areas are used to locate the posterior border of all complete and some partial denture bases.

Fovea palatinae are small pits or indentations found at the midline just behind the junction of the hard and soft palate. Since these pits are always found in soft tissue, they are often used as landmarks in locating the area for a complete denture posterior palatal seal.



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Figure 2-26. Impression, cast, and denture landmark identification—maxillary arch.

The soft palate should be represented in the impression. Even though every appliance does not extend to the soft palate, it is a helpful landmark.

The hamular notch is found posterior to the tuberosity and is formed by the maxilla and part of the sphenoid bone. It serves as a landmark to determine the extension of the posterior border of the maxillary denture. Since the notch is filled with soft tissue, which can be displaced, it is used as a seal area for the posterior border of the maxillary denture.

Mandibular landmarks are similar to maxillary landmarks with a few obvious exceptions. Our discussion is limited to two landmarks not found in the maxilla: the lingual frenum and retromolar pad, as shown in figure 2-27.

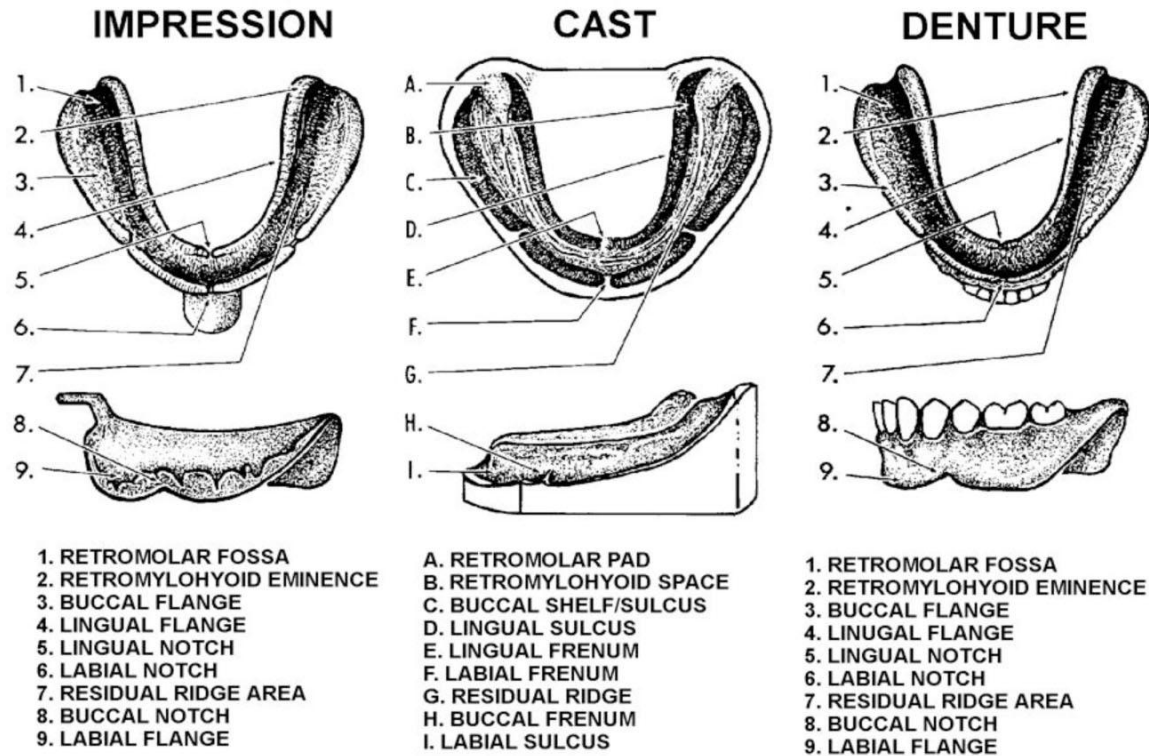


Figure 2-27. Impression, cast, and denture landmark identification—mandibular arch.

The lingual frenum is the string-like fold of mucous membrane that attaches the tongue to the floor of the mouth. It can be small and weak, or cord-like and fairly strong. It must be allowed unrestricted movement around and through the denture border or, as mentioned earlier, sore spots can develop in the patient's mouth.

The retromolar pad is a small pear-shaped bulge of mucous membrane at the posterior end of the mandibular alveolar ridge. The retromolar pad is included in almost all complete denture techniques as a seal area for the posterior border of the lower denture. It also supports the saddle of the RPD.

Disinfecting impressions

The disinfection of impressions has been addressed in a previous volume, so it is not covered again here. Infection control methods are continuously evolving. Follow the infection control guidelines and procedures of your local clinic to complete disinfection of impressions.

Preparing to pour impressions

Once you have an accurate impression, you are responsible for producing an accurate cast. Producing an accurate cast is simple if the impression and materials are prepared correctly. A minor mistake in any of these areas could cause a distorted cast.

Impression

Pour the impressions as soon as possible because all impression materials are subject to distortion. Cleanse impressions to remove mucous and saliva. This helps ensure accurate surface detail and eliminate the chance of soft spots in the cast. To cleanse the impression, rinse it under cool tap water, or lightly sprinkle stone into the impression and thoroughly rinse the stone away. If there is heavy mucous and blood in the impression, you might also need to brush it lightly with a large soft sable paint brush. Remove excess moisture by gently shaking the impression. *Never* dry an impression or use an air blast to remove moisture because you could distort or tear the impression material.

Materials

To produce a good cast, use a properly mixed gypsum product. Most often, you'll use a mix of hydrocol (dental stone). For a good cast mix, do the following:

- *Always* use a clean mixing bowl and spatula. The best time to clean a bowl and spatula is immediately after pouring the impression while the plaster is still soft and easy to remove.
- Measure the volume of water and weigh the powder before you mix any gypsum material. An accurate water-to-powder ratio is critical to ensure the properties of any gypsum product are maintained.
- *Always* add the powder to the water, *never* the water to the powder.
- Spatulate thoroughly, incorporating all of the powder evenly throughout the mix. Avoid whipping the mix as whipping will cause the final product to have excessive air bubbles.
- Vacuum mix using a power mixer-investor whenever possible. Vacuum mixing helps to eliminate incorporation of air into the mix. If you can't vacuum mix, jar the bowl against the bench top or hold it on the vibrator for a few moments.
- *Never* add water to a mix that is too thick; this interferes with the setting mechanism. It would be better to discard the mix and start over.

Pouring impressions procedures—two-pour method

Remember, the primary objective when you pour a cast is to capture all surface detail of the impression in as bubble-free a manner as possible. This is done using a vibrating table to make a thick, gypsum mix flow into all of the crevices of the impression. There are several ways to pour impressions, such as the upright, two-step, and boxed methods. You'll only study the two-step method of making a cast in two pours because it is the preferred method for pour preliminary and final impressions.

First pour

Begin by holding the impression tray so that the handle rests against the vibrator. Start at one end of the arch and flow a small amount of stone into the impression, letting it slowly advance to the other side as shown in figure 2-28. If necessary, adjust the vibrator's intensity so the stone moves slowly across the surface of the impression.

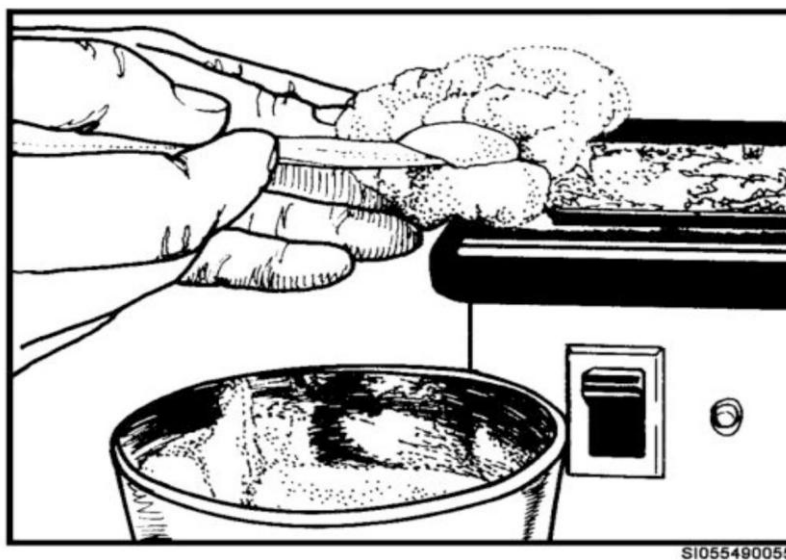


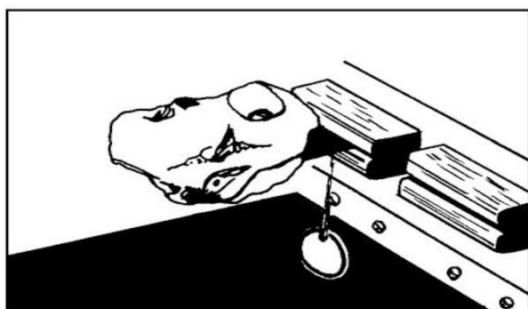
Figure 2-28. Pouring the first pour of an impression.

NOTE: The vibration intensity is too high if the impression jumps in your hand or the mix moves so fast that it skips over surface detail or if vibration wave patterns develop on the surface of the mix.

Flow the stone slow enough to watch the progress of the stone as you fill each tooth imprint. This should eliminate bubbles. If a bubble does appear, and does not disappear with vibration, pop it with a small instrument. Use a small instrument, such as an acrylic mixing spatula, to deliver nominal amounts of stone to minute preparations or to teeth with wide incisals and narrow cervixes. Touch the impression to the vibrator to flow each addition of stone.

After covering all of the critical surfaces of the impression, you may safely add progressively larger amounts of the mix. There is a rate of vibration that is best for each mix's ability to flow. The vibration intensity should be set high enough to make the material move across the surface of the impression. Continue filling the impression stone to a level slightly above the height of the impression walls. Make sure that you cover all of the peripheral roll areas with a layer of stone that is at least two millimeters (mm) thick. Do *not* flow stone over the outside of the tray because it must later be removed before the impression can be separated from the cast.

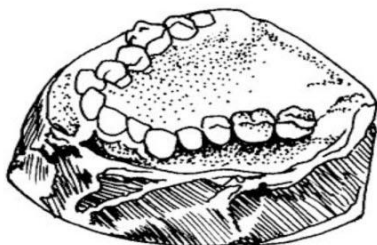
Last, add retention nodules to this first pour as shown in figure 2-29, view A. Stone retention nodules are used between the first and second pours so the two stone layers can be locked together mechanically. Place the handle of the tray in a holding device; do not lay the impression on the counter or the cast will be distorted. Now, let the first pour set for 15 minutes until it reaches initial set before making the cast base.



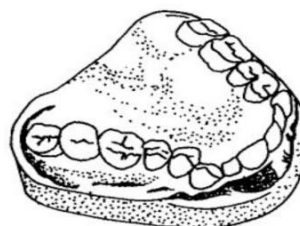
A. FIRST POUR WITH RETENTION NODULES



B. HARDENED FIRST POUR FLIPPED ONTO A STONE PATTY



C. CAST SEPARATED FROM THE IMPRESSION



D. CAST TRIMMED

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Figure 2-29. Two-step method of cast fabrication.

Second pour

It's now time for you to make the cast base. Use the cast trimmer to grind down the long retention nodules to 15 mm in height, with the tray parallel to the cast's bottom. With a second mix of stone, form a patty for the base. Add stone around the retention nodules using a dental vibrator and invert the pour into the patty. Now, use your spatula to shape the sides of the cast base as shown in figure 2-

29, view B. Take care not to bring stone up onto the tray, embedding the tray into the base. *With a mandibular cast, take time to smooth and contour the tongue space while the second mix is still soft.*

Here are the steps to complete the two-pour method:

1. Disinfect impression and rinse under running water.
2. Inspect impression for defects and spray with surface tension reducer, if indicated by manufacture.
3. Vacuum mix stone.
4. Vibrate stone into impression filling all negative areas and place retention nodules on first pour, ensuring nodules are at least 15 mm tall.
5. Let impression set in tray holder for 15 minutes, ensure perimeter of impression is not contacting any surface which could distort the impression.
6. Trim retention nodules parallel to occlusal plane, but do not reduce extensions less than 15 mm.
7. Vacuum mix second portion of die stone.
8. Form stone patty on plastic counter sheet.
9. Wet first pour and vibrate stone around retention nodules.
10. Invert impression into patty and shape base of cast taking care not to cover tray.
11. Remove excess stone from tongue space of mandibular and exterior of patty with spatula.
12. Allow stone to set for another 30 minutes.
13. Remove any stone contacting tray and separate cast from impression.
14. Trim base and sides of cast using cast trimmer and produce land area of proper dimensions, 4 mm labial/buccal with a 5 mm land area posterior to the pytergodomaxillary notch.
15. Trim tongue space of mandibular using air chisel, or large bur.
16. Dry cast and print patient's name on heel of cast using indelible ink.

Trimming casts

Casts should present a neat, attractive appearance. You trim dental casts on a machine called a model trimmer (fig. 2-30). This electrically operated machine has a 10-inch abrasive wheel, a small worktable, and a water-dispensing mechanism to keep the abrasive wheel rinsed clean. The worktable is located near the access opening to the abrasive wheel, and is usually adjustable so you can trim a cast at nearly any angle.

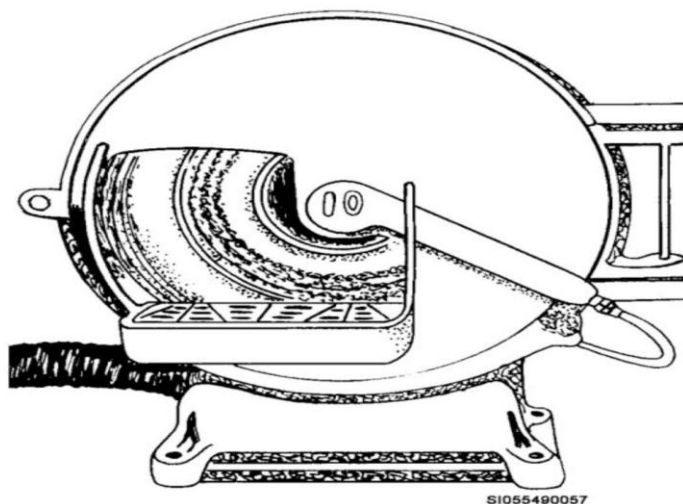


Figure 2-30. Cast trimmer.

Removing the impression

After the exothermic heat generated by the final setting reaction dissipates completely (about 45 minutes), trim any stone from the outside of the tray with a flask knife and separate the cast from the impression as shown in figure 2-29, view C. Do not hurry and force the tray or you may break off some teeth, especially if the tray is embedded in the base. If a cast is not separated from an alginate impression before the alginate shows signs of dehydration, the cast will probably show unacceptable surface damage.

Preliminary steps

Before trimming the cast, soak the base of cast in $\frac{1}{4}$ -inch of saturated dihydrate solution (SDS). Ideally, allow the stone to set for 24 hours prior to trimming; however, if this is not possible, the cast should soak with the teeth up, for at least one hour. *Never* trim a dry cast because the slushy debris coming off the trimming wheel falls on the dry surface and becomes permanently attached to the cast surface. It is also recommended to mark the cast with trimming lines. These lines will help you determine the base thickness; align the base plane to the occlusal plane of the teeth; and trim the outer boundary alongside the posterior teeth, the anterior teeth, and the posterior border of the cast.

Trimming

Figure 2-31 shows the desired cast dimensions for both a maxillary and mandibular cast. Start trimming the cast by grinding the cast bottom parallel to the occlusal plane of the teeth. The base of the cast should be about 15 mm ($\frac{5}{8}$ inch) thick at its thinnest place (usually the palatal vault of the upper and the tongue space region of the lower). Make sure the cast includes all of the denture support areas and all of the features that define denture borders. Keep the cast free of nodules or voids. When trimming a maxillary cast, make it as much like the general shape shown in figure 2-31. Trim a mandibular cast to correspond with the shape shown in the same figure. Fully represent the sulci areas in the cast, but not more than 3 mm deep. The sulci are routinely protected by a peripheral land area or ledge extending 4 mm outward. Make sure the cast extends 5 mm beyond the pterygomaxillary notch areas of the maxillary arch and 5 mm beyond the retromolar pads of the mandibular arch.

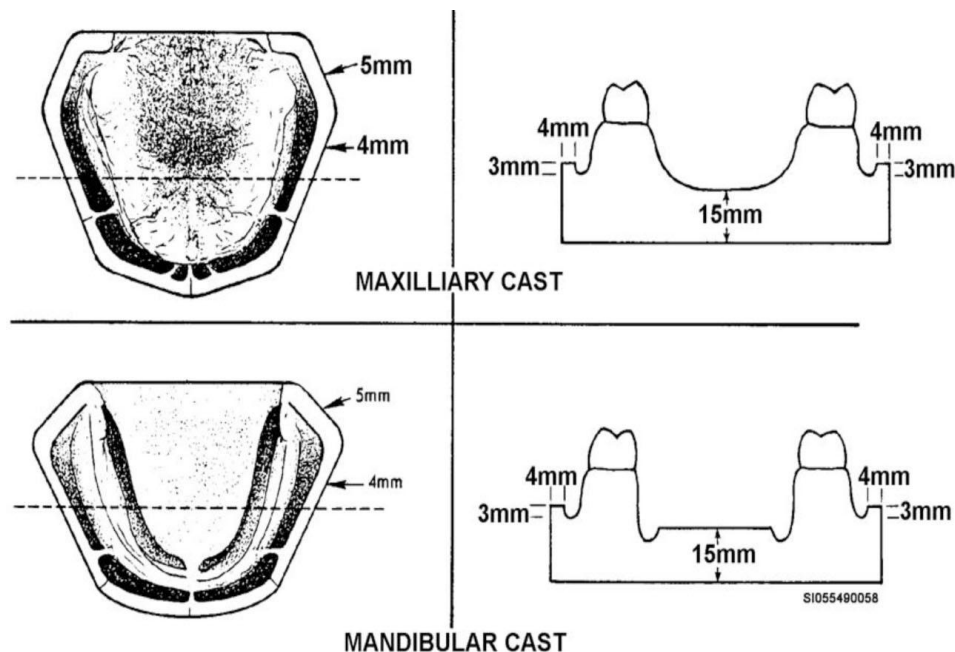


Figure 2-31. Trimmed maxillary and mandibular casts.

425. Shipping and receiving cases

By now you understand how much work goes into the production of a quality set of casts and how these models are the foundation of a quality prosthesis. The time and effort put into packaging a case is also an investment in the quality of the final prosthesis. Cases that are sent to area dental laboratories or other base laboratories must be packaged properly. Time, effort, and money are lost if cases are damaged or misrouted due to inadequate packing or shipping procedures.

Preparing for packing

Most dental laboratories have a designated shipping and receiving area. Be sure you have adequate space to work while packing and wrapping. Quality control plays a role in virtually every aspect of your job. As you prepare to pack a case for shipping, remember that what goes in this box says a lot about the standards of your laboratory. Use this opportunity to double-check the quality of the materials and to verify that all items are present.

The completed DD Form 2322

Once the case arrives at the ADL, the DD Form 2322 becomes the sole source of information for the prosthodontist and laboratory technicians. It must be complete and thoroughly describe the contents and fabrication requirements of the prosthesis. Ensure that all items to be sent are listed on the form. Check that blocks 1 and 2 are completed. This information is critical in the event the servicing lab needs to contact the base lab. Block 26, "Clinician's Remarks/Instructions," should contain detailed instructions from the prescribing dentist. Make sure the form is signed in block 28.

Inventory and identification

Make sure you have the correct number of copies of DD Form 2322 to be sent with the case and a copy for the base lab at this time.

- Send the original and one copy of DD Form 2322 for cases not requiring precious metals.
- Send the original and two copies of DD Form 2322 for cases requiring precious metals.

The DD Form 2322 should list all items to be included in the shipment. Use this to make sure that nothing is missing. See that all items have been disinfected and allowed to dry. Verify that each cast has been identified with the patient's name on the heel using waterproof ink. The base laboratory case number must be on items accompanying the case (i.e.; stone straps, impressions, bite registrations, bottles containing crown and bridge dies). The ADL shipping and receiving clerk will very much appreciate your efforts, and it ensures that these items are available during the fabrication process.

Packing the shipping box

Shipping boxes designed for mailing dental cases must be used to protect the fragile casts and dies. These boxes include custom foam inserts and do a terrific job when used correctly. Before inserting items into the foam compartments, place the casts and additional items in plastic bags (i.e., headrest covers). This helps to keep the foam inserts clean. Position the casts in the foam inserts with the bases facing the center, the heels down, and the teeth facing the end of the box. Pack individual dies in small containers (pill bottles) and adequately cushion the dies with cotton or gauze. Pack no more than one cast, impression, or pill bottle per slot in the shipping box. Use additional shipping boxes for extra items such as diagnostic casts, stone straps, or jaw relation records. Place the DD Form 2322 (without the carbons) against the top of the inside of the lid.

Wrapping

Wrap the box(s) with brown Kraft paper and tape securely with shipping tape.

Complete the address labels and affix them to the wrapped box(s). Do not apply tape or address labels directly to an unwrapped shipping box.

Multiple box shipments

It's common to need more than one box per case. Resist the temptation to crowd too many items in one box (this frequently results in broken teeth). Follow these guidelines when shipping a case in more than one box.

- Include a DD Form 2322 inside each box (in case the boxes get separated).
- Indicate the box number on the top of DD Form 2322 (e.g., 1 of 2, 2 of 2, etc.)
- Wrap multiple boxes together as a single package.

Receiving cases

Unwrap and unpack newly received cases carefully. Check that the prosthesis matches the DD Form 2322 and that all items are present. Remember as you remove items from the box that it contains a completed (and sometimes delicate) prosthesis. Disinfect the entire contents according to local protocol.

Documentation

All shipping and receiving cases are tracked using a shipping and receiving log. Local procedures will dictate its exact contents, but most contain information such as patient's name, dentist's name, type of prosthesis, date of shipment, and date of receipt. Document this information for each case passing through the shipping and receiving area.

Self-Test Questions

After you complete these questions, you may check your answers at the end of the unit.

424. Fabricating casts

1. Why should you inspect all incoming impressions?
2. What kinds of flaws may be present in an impression?
3. What three anatomical landmarks common to both arches are important in denture construction?
4. What anatomical landmark in the maxilla is used to determine the posterior extent of a maxillary denture?
5. What anatomical landmark in the mandible is a seal area for dentures and used to support the saddle of RPDs?
6. Why must impressions be poured as soon as possible?
7. How should you mix gypsum products?

8. Why should you avoid whipping the gypsum mix?
9. What advantage does vacuum mixing have over hand mixing?
10. Why should you not add water to a mix that is too thick?
11. When pouring impressions, what equipment is used to help eliminate air bubbles and to aid in making the stone flow into all crevices?
12. Why should you be careful not to flow stone over the outside of the tray?
13. About how long will it take before the first pour reaches final set?
14. What type of equipment is used to trim casts?
15. Why should you never trim a dry cast?
16. Normally, how thick should the base of the trimmed cast be?

425. Shipping and receiving cases

1. How is each cast identified prior to shipping?
2. What items are sent with a case and are identified with the base laboratory case number?
3. How are casts positioned in the shipping box?
4. Where is the DD Form 2322 placed in the shipping box?

Answers to Self-Test Questions

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1. The initial appointment.
2. DD Form 2322.
3. The prosthodontic assistant.
4. Request and coordinate for fabrication of items needed to perform procedure. Indicate the need for study casts, custom trays, and plastic stints used for construction of a temporary fixed partial denture FPD. Request completion date of these items not later than patient's next scheduled appointment and indicate this on the DD Form 2322.
5. DD Form 2322.
6. (1) Pour diagnostic casts.
(2) Make a custom tray.
(3) If needed, use the diagnostic cast to construct a temporary restoration.
(4) Place items into a metal prosthetic case pan along with the DD Form 2322.
7. Retrieve the case pan and ensure that the items requested were fabricated by the laboratory.
8. Prior to any tooth preparation.
9. A shade guide compatible with the porcelain material used in the fabrication of the restoration.
10. Each light source, whether it is daylight, fluorescent light, or color-corrected light, emits a wavelength of energy containing varying amounts of color. While some light sources will be high in blue and green, and low in red, others will be just the opposite.
11. Color-corrected lights are made to emit a broader spectrum of light for color comparisons.
12. View the shade selection at various distances—close-up and then far away. If you squint while viewing, the amount of light coming to the retina decreases and brightness differences will be more apparent.
13. In the yellow-red to yellow-orange range.
14. By going higher in brightness since it can be easily stained.
15. Initial preparation and establishing the margin or finish line.
16. The outline form of a preparation. It represents the border of a proposed restoration.
17. To remove sufficient tooth structure to accommodate for an adequate amount of restorative material for strength.
18. A tapered diamond rotary instrument in the ultra-speed handpiece operated with an air-water spray to keep the tooth debried and dissipate heat generated during the cutting process.
19. To retract the cheek and lips or tongue, and evacuate debris during the removal of tooth structure.
20. It will decrease the length of the clinical crown making reduction of the facial, lingual, mesial and distal surfaces, which follows easier.
21. Gingival retraction cord.
22. Polyvinylsiloxane.
23. A customized acrylic tray for complete arch impressions.
24. Proper control of supporting gingival tissue during tooth preparation, adequate isolation and moisture control during the impression procedure, and proper handling of the impression material.
25. (1) Displaces the free gingiva for completing the tooth preparation.
(2) Opens the gingival sulcus for the impression.
26. Paint the custom tray with tray adhesive that is compatible with the impression material.
27. A regular-bodied material is loaded into the custom tray, and a light-bodied material is injected around the sulcus of each individual tooth prepared as the retraction cord is removed.
28. To establish the proper occlusal relationship when mounting casts; reinforced bite registration wax, or dental stone mixed with slurry water.

29. The bitefork of the face-bow is covered with a uniform thickness of record base wax or modeling compound. The material is warmed and pressed against the patient's maxillary teeth to pick up a series of incisal edge and occlusal surface indentations.
30. It covers and seals the prepared tooth to prevent penetration of oral fluids and bacteria that can cause the tooth to become hyperemic and sensitive while the permanent appliance is fabricated.
31. The temporary should extend to the margin of the tooth preparation but not beyond it. Smooth and polish temporaries so they do not irritate the tongue, lips, cheeks, or gingival tissues. It provides the appropriate occlusal form and relationship to any opposed teeth and provide appropriate proximal contact relationships with unprepared adjacent teeth to prevent drifting. In an anterior area, it should provide acceptable esthetics.
32. Preformed acrylic resin and aluminum shell crowns.
33. Make an alginate impression before tooth preparation. After the tooth preparation is complete, lightly coat the preparations with lubricant. Sprinkle the tooth-colored autopolymerizing (self-curing) acrylic resin (powder and liquid) into the impression. Wet the polymer (powder) with monomer (liquid) until excess liquid appears. Fill the impression with self-curing resin up to the gingival line in the area to be temporized. When the resin in the impression reaches a doughy stage, place the impression over the tooth preparation and remaining teeth in the arch. Have the patient close on cotton rolls or folded gauze to maintain the position of the impression while the resin sets adequately. Use a blunt instrument to remove the temporary which remains on the tooth when the impression is removed. Finish the temporary before cementing it to the prepared tooth.
34. Use a diagnostic cast along with clear thermoplastic material and a vacuum-forming machine to form the plastic stint. Adapt a mismatched, uncured resin denture tooth to the edentulous space on the diagnostic cast, sticky wax it in place, and adjust the occlusion. Vacuum-form the clear plastic material over the cast. Cut the part of the formed plastic that includes the region of the fixed prosthesis, plus one or two uninvolved teeth anterior and posterior to it, to form the plastic stint. Use the clear plastic template (stint) as a mold to form a self-curing, temporary prosthesis in the patient's mouth, similar to the alginate impression method.
35. Must be trimmed, occluded, smoothed, and polished before cementing as an interim appliance.
36. (1) Consult the manufacturer's instructions for proper mixing of the cementing material.
(2) Use a small bladed instrument to place the cement onto the surface of the temporary which seats onto the preparation.
(3) Place the temporary onto the prepared tooth or teeth and fully seat the temporary.
(4) After the temporary cement is fully set, use the mirror and explorer to remove all excess cement from the crown and gingival area, and adjust the occlusion.
37. Make appointment arrangements with your patient before dismissing him or her. Annotate the DD Form 2322 with the date, time, and step of the next treatment planned, because this information is essential to the dental laboratory for fabrication of requested work for the next appointment.

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1. Because a vast amount of work must be accomplished in the laboratory between these appointments.
2. It's a cast used to duplicate the patient's prepared tooth (teeth), the other teeth present in the arch, and all associated soft tissue structures. It is used to establish the shape, proximal contacts, occlusion, and fit of fixed prostheses, from the simplest inlay to the most complicated complete mouth rehabilitation.
3. A positive reproduction of the prepared portion of a tooth in a hard, stable material, such as improved stone, acrylic, or metal.
4. The duplicate of the prepared tooth and an extension.
5. So the die will not rotate and can be placed back in the cast in the same position after every removal.
6. Any dental stone that covers the margin of a preparation has to be trimmed away. This task is referred to as die trimming.
7. A compound knife with #25 straight blades, red pencil, cyanoacrylate glue (super glue), and die spacer.
8. Outlines them lightly with a red pencil and paints the die's margin with cyanoacrylate glue to harden its surface and prevent smudging of the red pencil line.

9. Painting the die with die spacer allows enough room for the film thickness of cement so that the casting will seat completely. The die spacer must stop about one mm from the margin of the preparation for proper margin fit.
10. An exact wax replica of a desired shape.
11. A sprue is a channel formed by a wax, plastic, or metal pin through which molten metal will be cast into the mold. The purposes of a sprue channel are to provide an escape for pattern wax during the early stages of the burnout procedure, direct the molten metal from the crucible into the mold cavity, and provide a reservoir of molten metal upon which the casting can draw during solidification.
12. A process that involves placing the attached sprue and wax pattern in a casting ring, and embedding the pattern in an investment (heat-resistant gypsum) material.
13. When the investment material hardens, the sprue former is removed. The casting ring is placed in the burnout oven and the wax is then burned out to form a mold. The casting ring is then placed in the casting machine and molten metal is cast into the mold to form the casting.
14. By baking or firing the appliance in a porcelain oven.
15. A prosthesis with porcelain, but without a glaze.

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1. Use an instrument, such as a stellite, to loosen the temporary cement bond at the margin of the temporary. Then, clean the prepared tooth or teeth of any debris or retained temporary cement using a cotton pellet and cotton forceps.
2.
 - (1) Adjust proximal contacts.
 - (2) Adjust gingival aspect of the pontic tip.
 - (3) Adjust occlusion.
 - (4) Remove interferences that prevent the prosthesis from being fully seated onto the prepared tooth or teeth.
 - (5) Improve functional and esthetic contours.
3. The proper amount of contact exists when there is a slight snap of dental floss as the dentist passes the floss through the contact areas.
4. Visually, and by passing dental floss between the pontic tip and the ridge tissue. When fully seated, there should be very little, if any, pressure on the residual ridge mucosa.
5. The embrasure form (sloping space on either side of the proximal surfaces), cervical form, and incisal or occlusal shape.
6. Any surface roughness resulting from clinical adjustments is eliminated, and the metal is highly polished.
7. The dentist usually characterizes the porcelain for maximum esthetics. This involves the careful addition of surface stains to the porcelain prior to glazing the prosthesis.
8. To produce a restoration that is so natural as to prevent detection when seated in the patient's mouth.
9. Proximal staining, cervical staining, and extrinsic staining.
10. Glaze.
11. It must be returned to the laboratory to fire the stain and glaze onto the porcelain, and after firing it, any exposed metal is highly polished.
12. The quality of an excellent prosthesis can be reduced to merely satisfactory or ultimate failure.
13. Decreased physical properties of the material and could cause ultimate failure of the prosthesis.
14. Copalite varnish. Zinc phosphate is highly acidic during the initial setting stage because of the presence of phosphoric acid. Therefore, zinc phosphate can be quite irritating to the pulp tissues if the cementation process is not handled properly.
15. Reinforced ZOE (zinc oxide and eugenol), EBA (ethoxybenzoic acid), PCA (polycarboxylate), and glass ionomer cements.
16. The cementation process begins by isolating the treatment site with clean, dry cotton rolls, and drying the prepared tooth or teeth with a gentle blast of warm air or a cotton pellet and cotton forceps.
17. Prepare the cement according to the manufacturer's instructions.

18. It is carefully placed into each retainer or crown in a manner that eliminates the possibility of trapped air.
19. Initially, the dentist seats the prosthesis over the prepared tooth (teeth) and applies firm finger pressure to the occlusal or incisal surface to express the excess cement. The final seating is accomplished with heavier pressure. In anterior areas, tapping the appliance in place using an orangewood stick and plastic mallet; in posterior areas the orangewood stick and mallet can be used, however, the patient is generally instructed to bite into balsa wood or on an orange wood stick which is placed over the prosthesis.
20. Uses a sharp explorer tip to examine the marginal fit and verify that the restoration is completely seated.
21. The saliva ejector is placed into the patient's mouth.
22. Not until it has set to the point of being brittle-hard. Use an instrument, such as a periodontal curette, to remove all cement from around the restoration, tooth, and the gingival sulcus area.
23. Show them what superfloss or a floss threader is, show and tell them how to use these items, and then have them do what you have shown them. While they are performing the cleaning procedures, make corrections to their technique, if necessary.

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1. (1) Standard prosthodontic evaluation by the dentist, which includes a clinical examination using radiographs to conduct the evaluation, form a diagnosis, and determine a treatment plan.
(2) Maxillary and mandibular preliminary impressions.
2. A mirror, explorer, and cotton forceps setup on the bracket tray, impression material, powder scoop, water measure, spatula, mixing bowl, stock trays, and utility wax ropes available.
3. Have the patient remove any existing dentures and place them in a container of water.
4. Coordinate on the fabrication of items needed to perform chairside procedures involved in fabricating the complete denture. Indicate the need for study or diagnostic casts and custom trays for the next appointment. Request completion of these items not later than the date and time of the patient's next scheduled appointment.
5. Arrange the entire series of six appointments with the patient at the initial appointment according to an agreed minimum standard of time between each appointment for the various stages of treatment and laboratory work required. Include the dates, times, and items needed at each appointment when you initiate the DD Form 2322.
6. Diagnostic casts and custom tray located in a metal prosthetic case pan along with the DD Form 2322.
7. The dentist border molds the custom tray and makes a final impression.
8. Acrylic resin, shellac record base, or special tray material.
9. A mouth mirror, explorer, cotton forceps, sharp compound knife or disposable blade knife, compound stick, Bunsen burner, compound heater, custom tray, tray adhesive, and impression material.
10. Compound stick.
11. The dentist heats the compound stick with a Bunsen burner and fuses it to the edges of the custom impression tray, dips the tray into the warm water in the compound heater, and places the tray into the patient's mouth manipulating the tissue adjacent to the compound.
12. A sharp compound knife.
13. After the border mold is complete.
14. A light body, polysulfide (rubber-base) impression material.
15. The impression technique for complete dentures calls for a thin coating of impression material placed in the custom tray in such a manner that all surfaces are equally covered. Place only enough material to record fine detail in an already well-adapted custom tray.
16. Could cause a dangerous gag reflex, and the patient could aspirate the material into the trachea, if care is not taken.
17. Use the saliva ejector or high volume evacuator.
18. By using a mouth mirror and gauze square to wipe the material from the mirror.
19. Fabrication of a record with an occlusion rim, and date and time of the patient's next appointment on the DD Form 2322.
20. Master cast and record base with occlusion rim.

21. A base material constructed on the master casts that accurately fits the cast. It extends over the area designated for denture coverage and temporarily represents the base of a denture.
22. It is made of several layers of record base wax molded together. It simulates the amount of space formerly occupied by natural teeth and related tissue. Occlusion rims are constructed to standard, average dimensions, and attached to record bases.
23. The dentist modifies the shape, height, and thickness of the occlusion rim in keeping with the person's appearance and functional requirements.

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1. Records the relationship of the patient's maxilla to the mandible with the use of a face-bow transfer and interocclusal recordings; uses the record base with occlusion rim to record the interocclusal relationships and determine the amount of facial muscle support the patient needs; and contours the occlusion rims, makes a record of the patient's centric relation and vertical dimension of occlusion, and selects the shade and mold of the denture teeth.
2. Mouth mirror, explorer, cotton forceps, Bunsen burner, wax melting plate, wax spatulas, sharp knife, face-bow, record base with occlusion rim, and shade guides.
3. Occlusion of teeth when the mandible is in centric relation.
4. Any measurement of vertical distance made between the upper and lower jaws. A mandible can travel and stop anywhere on a path between maximum opening and closure.
5. VDO.
6. A measurement of vertical dimension made between the jaws when the muscles controlling the mandible are relaxed.
7. The occlusal of vertical dimension in most people with a natural dentition is two to four mm less than the physiologic rest measurement.
8. It is fused to the maxillary occlusion rim, orienting the plane of the fork parallel to the plane of the wax rim.
9. The maxillary occlusion rim with the plane of the fork parallel to the plane of the wax rim.
10. The positions of the patient's condyles.
11.
 - (1) Insert the maxillary occlusion rim with attached face-bow fork into the patient's mouth.
 - (2) Place the face-bow over the patient's face with the stem on the face-bow fork entering the clamp.
 - (3) Lock the ends of the slide bars over the skin marks indicating the location of the condyles.
 - (4) Lock the face-bow fork together with the clamp.
 - (5) Remove the entire assembly from the patient as a unit.
12. Maxillary anterior, mandibular anterior, maxillary posterior, or mandibular posterior matched sets in porcelain or plastic.
13. Anterior tooth sets consist of six teeth while posterior tooth sets consist of eight teeth.
14. Twenty-eight teeth. Third molars are not used in the fabrication of complete and removable partial dentures.
15. The esthetic effect of the patient's total image, matching the size, shape, color, and arrangement of denture teeth to a person's anatomical measurements, face form, sex, and age.
16. Modification.
17. Positioning teeth in a pleasing, functional manner.
18. A combination of facial length and width.
19. The shape of the person's face.
20. Shade guide.
21. A mold chart as a guide which indicates the mandibular anterior tooth size and shape that goes well with the selected maxillary anterior tooth mold.
22. Function.
23. The presence or absence of cusps (cusp height).
24. Natural posterior teeth are darker than the anterior teeth in the mouths of most people.
25. DD Form 2322.

26. To assist in the selection and proper positioning of denture teeth. The dentist shapes and positions the labial surfaces of the occlusion rims to approximate the amount of lip support required by the patient.
27. Adjust the vertical length of the maxillary occlusion rim.
28. As aids in choosing and positioning denture teeth.
29. The center of the patient's face.
30. The level to which the upper lip rises when the patient smiles and aids in determining the gingivoincisor length of maxillary denture teeth so the patient displays a minimum of denture base.
31. The proper width of the six anterior teeth.
32. Based on speech sounds using the record base with occlusion rim.
33. When the patient's upper and lower jaws are being held too far apart when natural or artificial teeth meet in maximum intercuspation.
34. Muscle of mastication soreness, inability to pronounce "s" and "ch" sounds clearly, and the teeth make contact noises while the person is talking.
35. The patient's jaws are too close together when natural or artificial teeth hit in maximum intercuspation.
36. Reduced biting power, and a great deal of space is visible between upper and lower teeth while "s" sounds are spoken (the teeth should barely miss).
37. With the occlusion rims that obviously hold the jaws too far apart. The patient slurs "s" sounds badly and the rims hit when the patient attempts to speak.
38. When the pronunciation of the "s" sound is distinct and the occlusion rims barely miss each other when the sound is spoken.
39. By positioning the mandible in centric relation and either keying the occlusion rim with grooves or sealing the rims together and removing the entire assembly from the patient's mouth.
40. Coordinate with the laboratory for the wax try-in and arrange the next appointment with the patient. On DD Form 2322, annotate the items needed for the next appointment, record the date and time of the patient's next appointment, and ensure that you also record the shade and mold of the denture teeth the dentist selected.
41. To mount the mandibular master cast in the articulator and as a foundation for arranging denture teeth to construct wax trial dentures.

416

1. For the dentist to use wax trial dentures to verify that jaw relations and denture esthetics are correct.
2. Mouth mirror, explorer, cotton forceps, wax knife, Bunsen burner, various wax spatulas, stones, and discs to alter tooth arrangement and shape, if necessary.
3. The appearance of the shade and mold of the teeth and simulated alignment of the teeth for adaption with the patient's lips and face. The amount of fullness provided by the wax in the anterior and lateral facial areas for a natural appearance. Adaption of the patient's lips and ability of the lips to cover the teeth and form a smile.
4. (1) The extension of the flanges of the denture for patient comfort, and retention of the prosthesis in the mouth during facial and tongue movements.
(2) The occlusion of the dentures.
(3) The amount of fullness provided by the wax in the anterior and lateral facial areas for a natural appearance.
5. A hand mirror for the patient to view the results.
6. Return the trial dentures to the laboratory for processing. Coordinate a completion date with the laboratory and reappoint the patient. Ensure information and any instructions for modification of the wax setup are recorded on the DD Form 2322.
7. Invest or flask the wax trial dentures. Boil out the flasks and remove the record base material and wax. Pack the mold with denture base resin and cure the resin. Recover the cured dentures from the mold and remount the dentures in the articulator. Correct processing errors with selective grinding, finish, and polish the dentures.

417

1. Delivery of the complete dentures to the patient.
2. The dentures from the laboratory, mouth mirror, explorer, cotton forceps, burs, stones, articulating paper and holder, pressure indicator paste, disposable brush, and hand mirror for the patient to view the final results.
3. Apply a light coat of pressure indicator paste to the tissue side of the dried dentures with a stiff brush. The dentist inserts the completed denture into the patient's mouth. When removed, excessive pressure leaves a bare spot on the denture that shows the point where pressure is exerted and the dentist relieves these areas on the dentures.
4. The edges of the dentures and makes any necessary adjustments.
5. By using articulating paper and stones in the handpiece.
6. The dentures are returned to the laboratory for a final polishing.
7. At least once a day, the patient should remove the denture and thoroughly clean all surfaces. A special denture brush may be used to clean the denture.
8. Keep the denture moist to avoid warpage of the acrylic.
9. To maintain healthy oral tissue.
10. The next day.
11. To prevent sore spots from occurring.
12. Mouth mirror, explorer, cotton forceps, pressure indicating paste, disposable brush, indelible pencil or disposable indelible marker, articulating paper and holder, and a selection of stones and burs for use in the handpiece.
13. The dentist marks the sore spot in the patient's mouth and then places the dentures into the patient's mouth to transfer the marking onto the tissue side of the denture.
14. To prevent plaque accumulation and irritation to the patient's mouth.

418

1. Replace fractured or missing artificial teeth, mend fractures of the acrylic denture base material, and repair clasps, rests, major and minor connectors of metal frameworks.
2. If denture base material is fractured to the extent that it is difficult to establish the exact original relationship of the material.
3. Complete a DD Form 2322 for the requested work and coordinate a date and time for completion of the repair.
4. After a patient wears a complete or partial denture for a period of time, it's common for the edentulous ridge to undergo a generalized reduction in size. Shrinkage results from the initial healing of ridges with immediate dentures. Later reduction occurs in response to excessive force being placed on the dentures. The patient's occlusal of vertical dimension may show progressive overclosure or the denture becomes loose. To correct these conditions without remaking the entire denture, the dentist may reline or rebase the denture.
5. The process of resurfacing the tissue side of a denture with new base material to make the denture fit more accurately.
6.
 - (1) A chairside reline resurfaces the tissue side of a complete or removable partial denture with new base material, tissue conditioning material, or other interim lining.
 - (2) A laboratory reline resurfaces the tissue side of a complete or removable partial denture with a laboratory processed material.
7. If the patient's tissue and ridges are inflamed, enlarged, or deformed from the trauma of the ill-fitting dentures or poor oral health.
8. Mix according to the manufacturer's instructions, place the material on the tissue side of the denture, and seat the denture in the patient's mouth. When the material sets, remove the denture from the patient's mouth. Use scissors and a sharp compound knife to trim excess material that flowed over the denture edges onto the polished surface of the denture.
9. The patient does not have to be without a denture for any period of time.

10. (1) Have the patient remove the denture.
 (2) Clean and disinfect it.
 (3) The dentist relieves or roughens the tissue side of the denture or adjusts the edges.
 (4) Apply a lubricant to the teeth and polished surface of the denture to prevent the cured lining material from sticking to these areas.
11. (1) Apply the lining material to the entire tissue surface of the denture base.
 (2) The dentist seats the denture into the patient's mouth and has the patient repeat movements used in border molding.
 (3) The dentist removes the denture from the patient's mouth after two to three minutes to prevent burning of the patient's tissues from the heat generated by the self-curing acrylic.
 (4) Place the denture in a bowl of warm water for 10 minutes to allow further curing of the acrylic.
 (5) After hardening, the dentist or laboratory trims the excess acrylic away and polishes the denture.
 (6) The dentist inserts the relined denture and makes needed adjustments.
12. Two appointments. Inform patients that they'll be without their dentures for at least 8 to 24 hours while the laboratory processes the dentures.
13. The denture. Clean and disinfect it; the dentist relieves the undercuts on the tissue side of the denture and reduces the edges with acrylic burs and stones; you paint the tissue side of the denture with tray adhesive.
14. All of the denture base material with new laboratory processed material without changing the occlusal relationship.
15. When the time factor is important, when the teeth are in good condition, or to serve as a temporary prosthesis while a new denture is being fabricated.

419

1. The standard prosthodontic evaluation. Complete oral and radiographic examination to conduct the evaluation, form a diagnosis, and determine a treatment plan.
2. A mirror, explorer, cotton forceps, periodontal probe, impression material, powder scoop, water measure, spatula, mixing bowl, stock trays, and utility wax ropes.
3. Alginate.
4. DD Form 2322, Dental Laboratory Work Authorization.
5. Metal case pan.
6. Surveys the diagnostic casts and draws a tentative RPD design on the cast.
7. As a visual aid to make rest preparations in the teeth and any other necessary contour modifications.
8. The metal substructure that provides a basic support for the connectors and saddle of the RPD.
9. A major connector that joins one part of the RPD to another.
10. The portion of the appliance that covers the oral mucosa of the alveolar ridge and retains the artificial teeth.
11. Special depressions the dentist cuts into the abutment teeth called rest and rest seats.
12. A natural tooth specifically used to retain, support, or stabilize an RPD.
13. Rests are metal projections on or near the clasp of an RPD; in a prepared recess on the occlusal surface, lingual surface, or incisal edge of a tooth.
14. A part of an RPD that acts as a retainer. It helps support and provides stability by partially encircling and contacting an abutment tooth.
15. The case pan with diagnostic casts and an instrument known as a surveyor.
16. To draw a contour map on the teeth and tissue areas of a cast so the helpful features can be used and the undesirable ones minimized in the design.

420

1. Preparation of the teeth including rest preparations and contouring of the teeth, cleaning and polishing the teeth, and final impression.

2. Occlusal surfaces—to support and hold the framework in place and allow clearance between the maxillary and mandibular teeth to accommodate the thickness of the framework. The buccal and lingual contours of the abutment so the dentures can be inserted and removed without binding and held in place by clasps.
3. Mouth mirror, explorer, cotton forceps, articulating paper and holder, high volume suction tip, high-speed handpiece, low-speed handpiece with latch attachment, and a variety of burs, stones, and points. You will also need the case pan with the surveyed diagnostic casts and DD Form 2322.
4. Scalers, curettes, low-speed handpiece with prophyl angle attachment, rubber polishing cup, pumice, and saliva ejector.
5. Alginate impression material and stock trays.
6. Impression material, powder scoop, water measure, spatula, mixing bowl, custom or stock trays, utility wax ropes and tray adhesive.
7. Pouring a final impression to make a master cast is one of the most crucial steps in RPD fabrication. A master cast has to be a precise, positive duplicate of the patient's dental structures from which a prosthesis can be made. To achieve this, alginate impressions must be poured within 10 minutes after removal from the patient's mouth.
8. Not until the RPD framework is ready.
9. An area dental laboratory. The surveyed and designed diagnostic cast along with a master cast and DD Form 2322.
10. A copy of the DD Form 2322, diagnostic casts, duplicate master casts, and RPD framework seated on the master cast.

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1. Try in the framework and establish and record the relationship between the maxillary and mandibular arches, if needed.
2. Mouth mirror, explorer, cotton forceps, contouring pliers, disclosing wax, wax spatula, Bunsen burner, handpiece, small rotary stones of various shapes and sizes, shade guide, and articulating paper and holder. You also need the entire case pan with the framework, casts, and DD Form 2322.
3. The fit of the framework, retention and position of the clasps, and the path of insertion.
4. To make adjustments to the clasps.
5. The dentist may have you melt the disclosing wax and place it on the tissue side in specific areas of the metal framework. When the dentist seats the framework in the patient's mouth, markings are made in the waxed areas that require adjustments for proper fitting.
6. The occlusion of the RPD frame against the opposing natural teeth.
7. To make the necessary adjustments to the framework and occlusion.
8. They are attached directly to the adjusted RPD framework. Make sure you coordinate with the laboratory.
9. On the DD Form 2322.
10. The dental laboratory must have enough time to set the artificial teeth, wax the denture bases, and process the resin (flask, boil out, pack, and process).
11. To insert the completed removable partial denture and make the necessary adjustments to the clasps and occlusion.
12. The RPD from the laboratory, mouth mirror, explorer, cotton forceps, pressure indicator paste, disposable brush, handpiece, burs, stones, points, articulating paper and holder, assorted pliers, and hand mirror.
13. To the tissue side of the dried, denture acrylic area with the brush. To see where pressure is exerted.
14. Relieves areas of excessive pressure, checks edges of the dentures, adjusts clasps for retention and removal, and refines occlusion and articulation.
15. They're returned to the laboratory for a final polishing.
16. Remove and thoroughly clean all denture surfaces daily; use a special denture brush; thoroughly rinse the oral tissues while the denture is not in the mouth; keep the denture moist when not being worn to avoid warpage of the acrylic; remove dentures from the mouth for several hours during each 24-hour period.

17. Areas of irritation where the denture is overextended or presses too hard on the tissue. To prevent sore spots from occurring, the dentist needs to see the patient the day after insertion of the dentures for adjusting.
18. To relieve acrylic areas on the denture, adjust the clasps, and make occlusion adjustments.
19. Mouth mirror, explorer, cotton forceps, assorted pliers, pressure indicating paste, disposable brush, indelible pencil or disposable indelible marker, articulating paper and holder, and a selection of stones and burs for use in the handpiece.
20. The dentist marks the sore spot in the patient's mouth with the indelible pencil or marker, then places the dentures into the patient's mouth to transfer the marking onto the tissue side of the denture.
21. Disinfect the dentures and take them to the laboratory for a final polish of the adjusted areas.
22. All acrylic areas on the periphery (edges) of a denture should be polished to a high surface gloss so that it will not irritate the patient's mouth. Areas on the tissue side of dentures may be smoothed with a soft rubber abrasive wheel or point, but should not be polished like the periphery areas. Any metal surfaces adjusted *except* clasp adjustments, should be smoothed and polished to prevent irritation to the soft tissue.

422

1. A device placed within the tissue of the mandible or maxilla for the purpose of providing support for the replacement of missing teeth.
2. A team of dentists consisting of properly credentialed prosthodontists, periodontists, and oral and maxillofacial surgeons.
3. Prosthodontics.
4. Patients who exhibit systemic diseases or disorders (cardiovascular, respiratory, nervous system, etc.) that interfere with their normal daily living patterns and patients with a dental history of grinding or clenching their teeth should not be considered because of the side to side pressure placed on the appliance.
5. Superiosteal.
6. The endosseous implant is set into or penetrates the bone but does not become fused to the bone. The osseointegrated implant is set into the bone and becomes fused with the bone forming a firm, direct, lasting connection between vital bone and the implant.
7. Fixtures. Titanium.
8. Branemark.
9. Separate anchors, called fixtures, of titanium are surgically inserted into the alveolar bone as a foundation for the prosthesis. Usually, 10 to 14 days after the surgery, an interim denture can be which is worn during the healing period of three to six months.
10. It begins by connecting the abutments to the fixtures, which requires surgery to expose the fixtures that have been covered by mucosa since stage one. The procedures necessary to fabricate the final prosthesis begin during stage two. The final prosthesis is completed within one to two weeks. However, several weeks to months may be required to complete fabrication and delivery of the appliance. In some cases, it's appropriate to make a provisional prosthesis first.
11. Quarterly at first. Eventually, the recall appointments are extended to every six months or once a year.
12. Approximately four to six months. Rinse with Peridex for control of bacteria until the tissue heals.
13. A Proxibrush or orange sticks.
14. (1) Wrap gauze strips or use superfloss to clean around the post and at the base of the denture.
(2) Use a water irrigating device (waterpik) as a supplement to the floss.
(3) Use a toothbrush with extra long tuft strands with bristles varying in length to brush the denture.
15. Usually quarterly from the time the appliance is inserted.
16. The use of conventional scalers is prohibited because the mechanical scratches produced eventually gouge the post. The gouging will contribute to plaque buildup because the patient cannot clean those very well.

423

1. Orthopedic appliances made of hard acrylic and designed to cover the incisal and occlusal surfaces of teeth in either the maxillary or mandibular arch.
2. Stabilize the teeth and provide for unobstructed excursive glides of the mandible.

3. Incorrect placement of the condyles in their fossae, muscle spasms, bruxing of the teeth, and lack or loss of vertical dimension of occlusion.
4. Appliance that increases the vertical dimension of the occlusion and used for patients who have gradually lost vertical dimension from wear, loss of teeth, or TMJ problems.
5. A defect in the roof of the mouth and nasal cavity that is confined to the soft palate or includes all or part of the hard palate. Palatal clefts extend anteriorly to include clefts of the anterior alveolar ridge.
6. Congenital clefts are present at birth. Acquired clefts are a result of injury, disease, or surgery.
7. A postoperative result of head and neck cancer.
8. Obturator.
9. An appliance, either rigid or flexible, used to immobilize displaced or movable parts used in the treatment of jaw fractures or to temporarily stabilize mobile teeth during the healing process.
10. The flight surgeon.
11. A facial impression.
12. Entire facial area from at least two inches above the eyebrows to at least two inches below the chin and slightly anterior to the tragus of the ear.

424

1. To check for inaccuracies in the impression and ensure that all anatomical structures are reproduced.
2. Distortion or missing vital portions, and the impression material may have pulled away from the tray; be too thin or slumped; or have voids, tears, bubbles, or distortions.
3. Residual ridges, labial frena, and buccal frena.
4. Hamular notch.
5. Retromolar pad.
6. Because all impressions are subject to distortion.
7. Add the powder to the water, never water to powder; spatulate thoroughly, incorporating all of the powder evenly throughout the mix; avoid whipping the mix; and vacuum mix using a mixer investor whenever possible.
8. Whipping the mix will cause the final product to have excessive air bubbles.
9. Vacuum mixing helps eliminate incorporation of air in the mix.
10. Adding water to a mix that is too thick interferes with the setting mechanism.
11. The vibrating table (often called the vibrator for short).
12. It must be removed later before the impression can be separated from the cast.
13. 15 minutes.
14. The model trimmer.
15. Because slushy debris coming off the trimming wheel becomes permanently attached to the cast surface.
16. 15 mm.

425

1. Patient's name is placed on the heel of the cast in waterproof ink.
2. Stone straps, impressions, bite registrations, and small bottles containing dies.
3. Bases of casts face the center with heels down and teeth facing the end of the box.
4. Against the top of the inside of the lid.

Glossary

Abbreviations and Acronyms

PFM	porcelain-fused-to-metal
FPD	fixed partial dentures
ZOE	zinc oxide & eugenol
EBA	ethoxybenzoic acid
PCA	polycarboxylate
MI	maximum intercuspation
VDO	vertical dimension of occlusion
mm	millimeter
DTR	dental treatment room
RPD	removable partial denture

Student Notes

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