

Immediate dentures

Immediate denture is a dental prosthesis constructed to replace the lost dentition and associated structures of the maxilla and or the mandible and inserted immediately after the removal of the teeth.

Indications for immediate denture

1. Patients who need to remove hopeless remaining teeth because of advanced periodontal disease or decay which usually result in loose or badly caries (non-vital) teeth.
2. Patients with severely tilted teeth and malocclusion to replace them with denture in the same visit.
3. Socially active patients who wish to retain their natural appearance.

Contraindications for immediate denture

1. Patients who are in poor general health or at surgical risk due to complicated systemic diseases that affect healing or blood clotting and preclude multiple extractions (diabetic patients, cardiac diseases, post irradiation of the head and neck regions).
2. Emotionally disturbed or diminished mental capacity.
3. Uncooperative patient or indifferent patient who is not willing to accept the treatment mentally and psychologically cannot understand and appreciate the scope, demands and limitations to the course of immediate denture treatment.
4. The patient who cannot afford multiple visits.

Advantages:

1. maintenance of patient's appearance, psychological and social wellbeing so he does not have to go without teeth and there is no interruption of a normal lifestyle of smiling, talking, eating and socializing.
2. Preservation of oral support, muscle tone, vertical dimension of occlusion, jaw relationship and face height.
3. Less post-operative pain because the extraction sites are protected by the immediate denture.

4. Post operative hemorrhage and infection are also prevented due to the protective action of the denture. It acts like a splint for the tissues to help control bleeding and to protect against trauma from the tongue, food, or teeth of the opposing arch. Also, to keep mouth fluids and food particles from entering the tooth socket and to protect the blood clot and thus promote rapid healing.
5. The patient adapt more easily to the dentures while recovery from surgery is progressing.
6. It is easier to duplicate the natural tooth shape and position plus arch form and width, the horizontal and vertical position of the anterior teeth.
7. There is less difficulty in making the polished surface of the dentures compatible with the surrounding structures because the tongue, lips, and cheeks have not altered their positions because of lack of tooth support.

Disadvantages

1. Immediate denture is more difficult and demanding procedure, more time is needed, additional appointments and increased cost.
2. There is no opportunity to observe the anterior teeth at the try-in appointment, therefore the esthetic result cannot be evaluated until the denture is inserted. Careful planning, operator experience & attention to the details can solve this problem.
3. Retention problems because sometimes it is difficult to accurately record a posteriorly located undercut area in the presence of anterior undercut area caused by the presence of the remaining anterior teeth.
4. The presence of different number of remaining teeth in various locations frequently leads to incorrect centric occlusion or improperly recorded vertical dimension of occlusion. Therefore, an occlusal adjustment or even selective pre-treatment extraction may be needed to record an accurate centric jaw relation at the proper vertical dimension of occlusion.
5. The resorption of bone and the shrinkage of unhealed soft tissue are greater and faster than the changes of healed tissue. These changes require new impressions to keep the denture base adapted to the basal seat. Relining & remounting of the dentures to improve the occlusion is necessary whenever the denture base is altered.
6. Functional activities (speech and mastication) are likely to be impaired, but this is temporary inconvenience.

Types of Immediate Dentures

1-Interim immediate dentures (IID)

Is a transitional dental prosthesis used for a short interval of time for reasons of esthetics, mastication, occlusal support, convenience or to condition the patient to the acceptance of an artificial substitute for his missing teeth until more definitive prosthetic therapy can be provided. The interim immediate dentures used temporarily during the healing period

of the patient to preserve ridge contour until the permanent denture can be fabricated. They are mainly indicated in patients with periodontal disease that need full arch teeth extraction and these remaining teeth support a removable partial denture that the patients desire to retain until insertion of the complete denture.

2-Conventional immediate dentures (CID)

It is a definitive classic immediate denture which can be later modified (relined) to serve as the permanent prosthesis. The CID is usually selected when only anterior teeth remain or if the patient has anterior teeth and few posterior teeth and he is willing to have the posterior teeth extracted & after the healing period, immediate denture procedure begins.



Comparative Advantages and Disadvantages between Interim and Conventional immediate denture.

	Interim (IID)	Conventional (CID)
1	transitional or short-term prosthesis, & after the complete healing, a second denture is made	definitive or long-term prosthesis & after the healing, it is relined
2	usually both anterior and posterior teeth are remaining & they support a removable partial denture that the patient desires to retain until full arch extraction & denture insertion.	usually only anterior teeth remained, or anterior teeth & few posterior teeth remain that do not support an existing removable partial denture
3	has only a fair retention and stability at insertion which must be improved by relining (tissue conditioner) during healing period	usually has good retention and stability at placement which is possible to maintain during the healing period

4	the overall cost is higher because it includes the cost of the IID denture and a second denture	the overall cost is less because it costs the CID plus a reline
5	treatment process takes less time as denture fabrication procedures can begin right away.	treatment process takes longer time because there is a delay of 3-4 weeks for posterior teeth extraction sites to heal partially before making the final impression.
6	indicated when only one extraction visit is possible for the patient	indicated when two extraction visits are possible for the patient
7	allows an alteration of aesthetic and any other factors if indicated in the second denture	aesthetics cannot be changed because it is definitive denture
8	the patient has a spare denture to use at the end of the treatment	the patient has only one denture at the end of the treatment
9	posterior teeth are not removed before fabrication of the IID & the vertical dimension of occlusion may be preserved.	If all the posterior teeth are initially removed, the vertical dimension of occlusion is not preserved
10	can be useful to convert existing prosthesis to an IID	is not useful for converting existing prosthesis such as removable partial denture

Diagnosis And Treatment Planning

The diagnostic findings are determined by investigating the local oral conditions, the patient's mental attitude, systemic status, and past dental history. The diagnostic procedures can be divided into two phases

1. Patient examination: The examination should include finding of local and systemic conditions.

The finding of local factors which are evaluated by full mouth radiographs (peri apical radiograph may be useful for localized area, while OPG gives a general view for both jaws in single image). Head and neck examination is performed, accurately articulated study casts, periodontal probing and visual and digital examination.

The local factors which are important in complete immediate denture treatment are:

- The condition of the teeth to be extracted which may require extensive surgery such as endodontically treated roots, multi-roots teeth, ankylosed roots, hypercementosis & hooked or curved roots.
- The positions of the teeth.

- The presence of bony undercuts or exostosis that requires extensive surgical procedures at the time of insertion of the denture which may result in condition unfavorable to a good prognosis.
- need for frenum release if necessary.
- The shade and shape of the existing teeth should be determined. Patient should be asked if they like their current shade and tooth position and what changes they would like to make.
- The patient's existing midline and the need for modification of its position, the patient existing vertical dimension of occlusion and the amount of interocclusal distance, the present amount of horizontal and vertical overlap of anterior teeth.
- Examination of any existing prosthesis for shade, shape & tooth position, lip support and smile line

Systemic status also should be evaluated for the partially edentulous patients, any systemic complication that adversely affects the formation of the essential component of healing and of soft and hard tissue regeneration will offer a poor prognosis for immediate complete denture.

2. Consultation interview: A careful explanation to the patient of the limitations of immediate denture service should be given. Preparing the patient and proper selection of the patient is the main factor to successful immediate dentures. The patient should understand all the sequences of the treatment, cost, time, and number of visits.

Treatment plan of immediate denture includes:

1- Oral prophylaxis: The patient should have a general scaling of the teeth to minimize calculus deposits & to reduce post-operative edema and chance of infection.

2- Tooth modification: Many immediate dentures will require modification of opposing teeth to correct the occlusal plane or to eliminate prematurity in centric relation which affect the registration of centric relation when they interfere with guiding the patient into the centric relation position. This tooth modification should be done on the patient in advance of the final impressions.

3- Diagnostic mounting of pre-extraction casts: The analysis of the occlusion and plane of occlusion is best done by performing a diagnostic cast and carefully evaluating the planned changes. The casts can serve to plane the treatment and as pre-extraction record and to construct special tray.

4- Photographs of the patient is included as a part of permanent record. Evaluation of the lip support, position of high lip line, low lip line, and amount of tooth exposure in function

as during normal speech is important. Tooth mold and shade selection should be done at this stage of treatment plan.

Prognosis of immediate denture treatment: All the prior diagnostic findings will allow the dentist to determine a prognosis for immediate denture. At this point, there will be a good indication of which type of immediate denture is best for the patient, the anticipated difficulties, esthetic demands on the part of the patient & once the patient understand and accept the diagnosis and treatment plan and prognosis, the actual treatment can begin.

Clinical Procedures

The procedures for fabrication of conventional immediate denture are similar to these for making complete denture with some modifications.

1. Extraction visit

if multiple extraction is needed [posterior and anterior], usually posterior teeth removed as soon as possible. Opposing bicuspids may be retained to preserve the vertical dimension of occlusion. These posterior areas are allowed to usually heal 3-4 weeks. Any other required hard and soft tissue operation is usually done at this first surgical visit (tori reduction, tuberosity reduction and frenectomy). If any posterior teeth are proposed as overdenture abutments, endodontic treatment can be done earlier, and the abutments can be morphologically modified.

2. Preliminary impression and diagnostic casts:

The impression is made with alginate in stock tray. Periphery wax is adapted to the borders of the tray to reach the vestibules and undercuts formed by the presence of teeth. The palatal surface of the upper tray needs to have wax added to reach the palatal tissues. Location of the posterior limit can be marked in the patient mouth with an indelible pencil, this will transfer to the impression surface, the impression should record the full extensions planned for the denture prosthesis.

When the teeth were so loose that it would extract during impression making, it can be blocked out by adding periphery wax at the cervical areas or by applying a lubricating medium to the teeth or by placing copper bands over the loose teeth or by placing holes in the tray .These impressions are poured in stone and are used to make custom trays for the final impressions.

3. Custom trays and final impression

The objective of the final impression is to record the tissues in maximum accuracy that minimize the insertion, post-insertion adjustment.

The techniques may range from simple to more complicated in the tray design and materials used for final impression. Selection of a suitable technique depending on

- a) Teeth and tissue undercut
- b) Number and location of teeth included in the immediate denture treatment.
- c) Type of the planned surgical operation
- d) Type of impression material.
- e) Dentist skill and experience.

There are two ways to fabricate the final impression trays.

A- Single full arch custom impression tray:

This method more closely resembles a routine custom tray for removable partial denture, it can be used in CID technique (only anterior teeth remain) but it is the only tray that can be used for the IID technique (anterior & posterior teeth remain).

To fabricate the custom tray in IID, the teeth area is blocked out with sheet wax (2mm wax thickness for elastomeric materials & 3-4 mm for alginate). In CID, the edentulous area is blocked out and treated like a complete denture impression tray. Stop effect is established by providing holes through the wax anteriorly and posteriorly. The tray 2-3 mm short at the vestibules and extended to include the posterior limits [posterior palatal seal, hamular notch & retromolar pad]

Autopolymerising acrylic resin or light cured resin try is fabricated, border molding by tracing compound is achieved and the final impression is made in any elastic material [irreversible hydrocolloid, polysulfide rubber base, polyvinyl silicone or polyether].



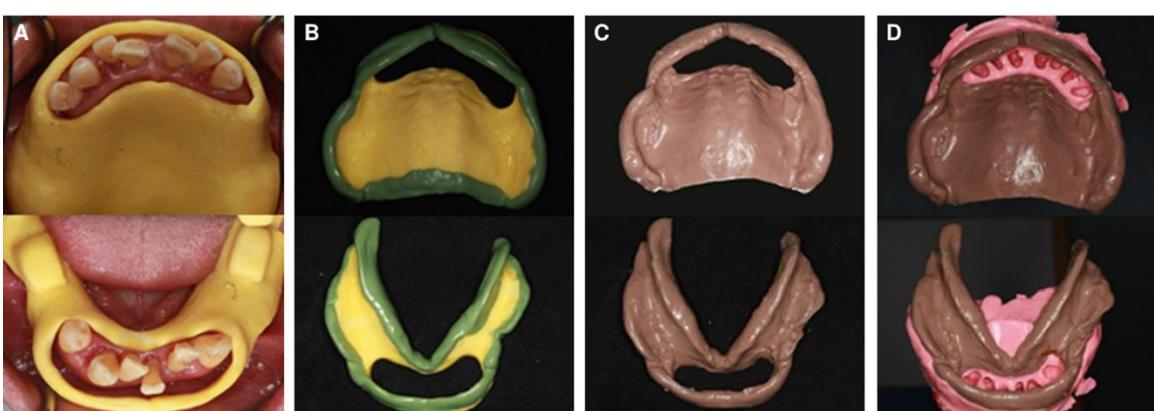
B- Tow trays or sectional custom impression tray:

This method is used only when posterior teeth have been removed (CID), it cannot be used in IID technique because usually there are posterior teeth present. It involves fabricating two trays on the same cast; one in the posterior which is made like an edentulous tray covering the edentulous area up to the incisal edges of the anterior teeth. The borders of the tray 2-3 mm shorter of the vestibules but covering the posterior limits. The tray is made with wax block out for tissue undercut area and interdental

spaces and undercuts around the teeth, then adapt autopolymerizing acrylic resin to the posterior edentulous areas. The tray should cover the lingual surfaces of the teeth only and extend up beyond the incisal edges of the teeth to include a handle.

For the anterior section either adapt a custom tray or we can cut and modify plastic stock tray, this tray should cover the labial surface of the teeth and the vestibule. You can also remove the handle of the first custom tray after impression making and use a stock tray for teeth impression in combination with the first tray.

The tray is tried and border moulded with tracing stick compound and then posterior impression is made in any impression material desired [zinc oxide-euginol paste, ,polysulfide rubber base ,polyvinyl silicone, polyether] ,the posterior impression is removed and inspected ,then it is placed in the mouth and the second tray is inserted with alginate impression material to cover the anterior teeth and the labial vestibule & when it set, both trays are removed together. The most important consideration in sectional tray technique is the careful proper reassembly of the two separate impressions and care must be taken not to distort this assembly during pouring the impression.



4. Vertical dimension and centric jaw relation:

If all teeth are present or enough teeth to be articulated as in patient with IID, no need to construct a record base and occlusal rim.

If remaining teeth are scattered or only few upper and lower teeth are present and in patients with CID, auto-polymerizing resin record base is adapted to the edentulous areas of the cast as for complete dentures, wax occlusal bite rim is constructed to the proper height and width. The remaining teeth and anatomical landmarks such as the retromolar pad can serve as a guide to the height of the rims. It is important that the record bases be stable and strong to record centric jaw relations.

The patients existing vertical dimension of occlusion is recorded as in complete dentures. Increase in VDO is sometimes required because uneven tooth loss, loosening of the remaining teeth, and tooth wear could create overclosure. Sometimes, the VDO will have to be closed because teeth drifting and overeruption opened it, this can be done by grinding the natural teeth on the master cast. The occlusion rims are trimmed to the desired vertical dimension of occlusion and a recording of centric jaw relation are made, the casts are mounted on the articulator and send to the laboratory for setting of the teeth with complete information about the teeth to be extracted with tooth shade.

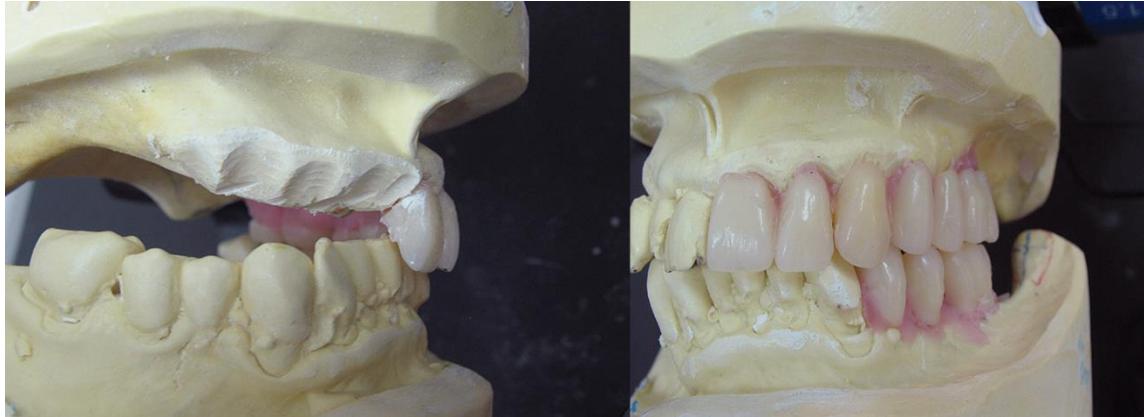


5. Setting the dentures teeth:

The articulated casts are used for setting any anterior or posterior teeth that are missing. Set the teeth in centric occlusion. Acrylic teeth are the recommended type.

Setting anterior teeth for immediate dentures : more than one method can be used to trim the teeth in immediate denture depending on the teeth if they need to be changed in location or alignment to improve the aesthetic. If the teeth are well aligned aesthetically and functionally acceptable then we can reproduce same alignment in the denture.

An alternative tooth setup suggested setting of every tooth in the maxilla first at least one canine, central incisor, and lateral incisor then the mandible, then remove the remaining teeth and complete the set up using the pocket depth as a guide for the trimming. The facial portion of the extraction site can be trimmed to the pocket depth line.



6. Try In

1. If anterior and posterior teeth remaining (IID), try-in cannot be made
2. If only anterior teeth remaining, try-in for centric relation and vertical dimension can be made as in CID

The trial denture bases are tried in the mouth and used to verify vertical dimension of occlusion and centric relation as with complete dentures. In case of centric off, the lower cast is remounted with new centric relation record until the articulator mounting and the patient centric relation coincide. It is important at this visit to take time with the patient to record landmarks on the casts and to confirm the patients' esthetic desires. The midline or newly selected midline is recorded on the base area of the master casts & the high lip line should be determined.

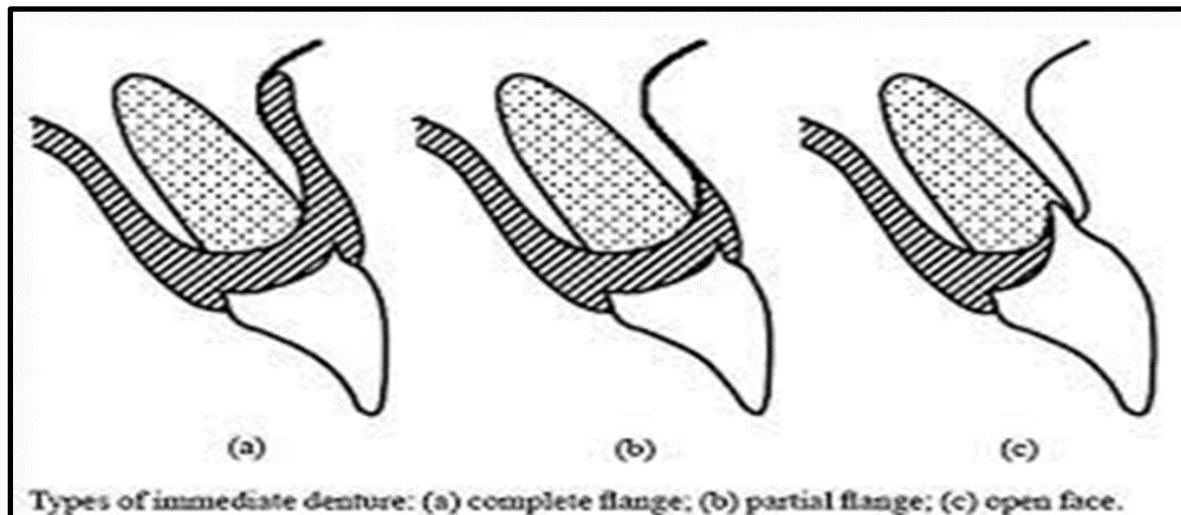
Some patients want perfect looking teeth whereas other patients will not want friends and colleagues to know anything has changed and want more natural appearance. On the cast, marks of the pocket depth & free gingival margins and a drawing of where the new tooth position should be done. A discussion of surgical and denture placement procedure should be discussed to prepare the patient, then the cast can be sent to the laboratory for setting of the anterior teeth.

The wax contour is similar to that of complete dentures except we need to increase the thickness of the labial flange anteriorly to provide room to trim from inside to relieve the sore spots or to seat the dentures which can be later reduced after the removal of all sore spots. An extra visit to recall the patient for a look at the final wax up is good to reassure some worried patients.

Immediate denture can be classified according to flange design.

1. flanged type (a-complete flange, b- partial flange)
2. flangeless type (open face or socket type)

In case of flangeless denture [gum fit, socket fit], it is indicated when the premaxilla is prominent. You must prepare root socket [5mm depth] on the stone model in the direction of the root at the place of anterior teeth. The neck of the artificial tooth is placed in the preparation & at the time of insertion, the neck of artificial tooth will just enter the socket of the extracted tooth .



There are certain differences between the types of immediate denture regarding to flange extension:

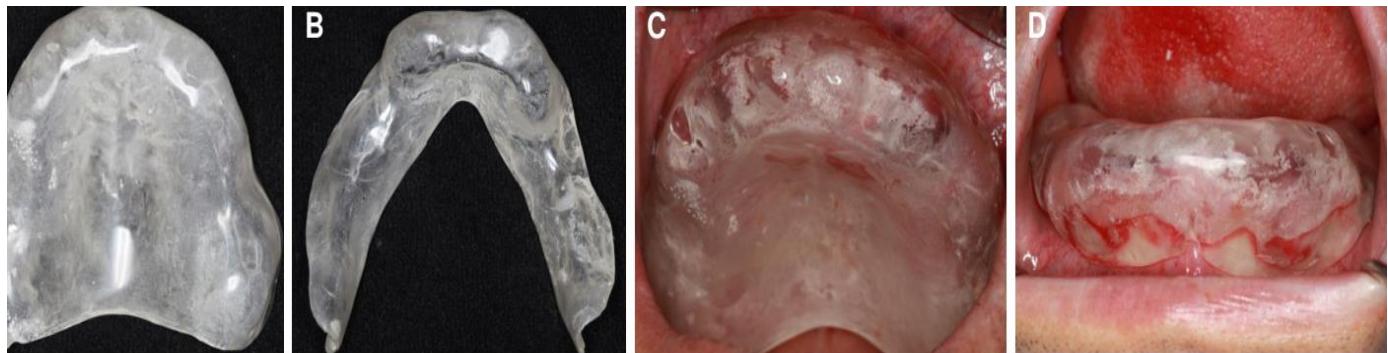
1. The flanged denture covers the clot completely and protect the area, also the flange denture exerts equal pressure on both lingual and labial sides reducing post extraction hemorrhage.
2. appearance of flanged denture does not change after fitting where the appearance of flangeless type is good initially but can deteriorate rapidly as bone resorption creates a gap between the necks of the teeth and the residual ridge.
3. The flanged denture allows freedom in the positioning of teeth, whereas in open face denture, teeth have to be positioned in the sockets of the natural teeth therefore in case of malposition teeth in flanged denture, the tooth position can be altered while in socket type it will be difficult.

4. In upper denture, a flange on an upper denture creates a more effective border seal & better retention than is achieved with an open face denture.
5. The presence of labial flange produces a stronger denture labial flange & will make the denture stiffer, so the midline fatigue fracture caused by repeated flexing across the midline is reduced.
6. The presence of labial flange makes it easier to add tissue conditioner. The color of some reline materials is not always ideal or changed with time.
7. Socket fit lower denture is not usually constructed because of poor stability of the lower denture during function.

Surgical Template

Is a thin transparent form made of clear acrylic that duplicates the tissue surface of an immediate denture. It is constructed on the cast after it is shaped to normal contour [duplicated cast] and is used as a guide for surgically shaping the alveolar process at the time of extraction. When any amount of bone trimming is necessary to improve the shape of the alveolar bone then the template is seated. When it fits properly, this means the shaping of the bone is adequate.

To fabricate a surgical template, take alginate impression for the master cast after the cast has been trimmed at boil –out stage then pour the impression with stone then make a clear resin template on this duplicated cast.



7. Processing and finishing ;The immediate dentures are processed and finished in the usual manner of complete denture ,keep the undercut areas of the denture slightly thick at this stage to allow for insertion over the undercuts ,it is best to keep all posterior undercuts at this point, they do not need reduction ,but it can be well managed by selecting an upward and backward path of insertion of the denture .Any bumps inside the immediate denture resulting from over trimming of the cast should be reduced to allow for a convex ridge healing, these procedures are duplicated on the surgical template. Both the immediate denture and the surgical template should be placed in a chemical sterilizing solution in a bag for delivery .

8. Placement and Post-Operative care

Surgery and insertion of the dentures; The patient can see the dentist first for reduction of any over denture abutments or sectioning of any preexisting fixed partial dentures, then extract the remaining teeth.

In case of multiple extraction, start with the posterior teeth to prevent damaging the wound. To preserve the labial plate of the bone, no bone trimming is done. The surgical template is used as a guide to ensure that bone trimming is done adequately. The template should fit and be in contact with all tissue surfaces. Inadequately trimmed areas planned for bone reduction will blanch from the pressure and be seen through the clear template. The template is removed, and the bone or soft tissue trimmed until the template seats uniformly and completely. This indicates that the dentures will seat as it was originally intended to ensure proper occlusion and minimally induced discomfort. Sutures are placed where necessary.

The denture should have good bilateral occlusion with no gross defective contacts. Pressure areas on the denture can be located with pressure indicating paste and trimmed. If the occlusion is not correct, the denture should be rechecked for seating particularly distally in the denture heel areas. A quick occlusal correction is done to allow simultaneous bilateral contact. Further modification of occlusion usually is done later, the frenum should be checked for proper relief.

When both anterior and posterior teeth were extracted, tissue conditioning liner can be used to increase retention and for faster healing, but the material should not be allowed to get into the extraction sites, it should be trimmed by rounded hot instrument.

Postoperative Care and Patient Instruction in the first 24 Hours

1. The patient should avoid rinsing and drinking hot water and avoid removing the denture during the first 24hrs to reduce bleeding and pain, because inflammation, swelling and discoloration are likely to occur. Their partial control can be helped with ice packs for 20 minutes on, 20 minutes off on the first day.

Because of swelling, premature removal of the immediate denture could make its reinsertion impossible for 3-4 days or until reduction of swelling, the patient should be reminded that the pain from the trauma of extraction would not eliminate by removal of the denture from the mouth.

2. The diet for the first 24hrs should be liquid or soft.

3. Analgesic medication are prescribed as required

4. Patient is seen after 24hrs for sore spots, commonly these areas include cuspid eminences, lateral to tuberosities, posterior limit areas and retromylohyoid undercuts. The related areas are relieved in the acrylic resin and border extension are checked and relieved by using pressure indicating paste.

5. Adjust any gross occlusal discrepancy in centric relation. If the retention is not adequate, tissue conditioning material may be used to improve the retention.

6. After the 24 hours visit, the patient should be shown how to remove the denture after eating to clean it and to rinse the mouth at least 3-4 times daily to keep the extraction site clean .

7. For the first post-operative week, the patient should continue to wear the immediate denture at night for 7days post extraction or until the swelling resolved.

8. After 1 week, remove the sutures and change the tissue conditioner if it has been used.

9. During the first month after insertion, the patient is seen on request or weekly as required for sore spot adjustment. Denture adhesives can be used during this period as an aid if retention is lost between visits.

10. After 2 weeks, remount casts are poured, and centric relation registered, and adjustment of occlusion is performed. If the opposing arch is not denture, a cast of opposing arches is made in an irreversible hydrocolloid impression and related to the immediate denture on the articulator.

Subsequent service for the patient with an immediate denture:

After the sore spots are eliminated and tissue have healed, a recall program for changing the tissue conditioner liner is organized. Ridge resorption is faster during the first 3 months. The frequency of changing the liner depend on the rate and amount of bone resorption, denture hygiene frequency and methods, diet and smoking habits.

Researches shows that complete socket calcification is complete at 8-12 months following tooth extraction and the bone volume of the ridge is reduced 20-30% during the first 12 months, the resorption in the lower ridge is about twice that for the upper ridge ,and so the immediate denture should be relined after that time to improve the retention of the denture after remodeling of the residual ridge. During this period, the patient will prefer to have reline within the first 3-6 month, but they should be told that their denture supporting area will continue to remold and further reline will be necessary.

When patients with immediate overdentures have an indication for an overdenture attachment, it should be accomplished after healing and before the definitive prosthesis so that attachment components can be processed into the second denture or reline.

Immediate denture can be classified according to type of restoration into:

- 1.Immediate complete denture
2. Immediate partial denture.
- 3.Immediate overdenture.

Immediate partial denture could be either new or done by adding teeth to the existing denture normally made of acrylic with ball clasps, it is transitional and should be replaced after healing with cast CO-CR removable partial denture. The clinical procedures start by putting the partial denture in the patient mouth, take alginate impression, remove the impression with the partial denture and pour a cast, break teeth to be extracted and add artificial teeth to the denture and process. Advantages of adding teeth to existing partial denture that is quick method, economic, & no need for adjustment or change in esthetic.