Impression techniques for RPDs
An impression, of a partially dentate arch must record accurately the anatomic form of the teeth and surrounding tissues so that ..
• Primary impression ➔ primary cast
• Secondary impression ➔ master cast

Framework construction

• + or – functional impression
Methods used to rescored tissues

Anatomic (mucostatic) impression
For tooth supported edentulous areas (i.e. Kennedy Class III)

Functional impression
For tooth tissue support

Physiologic impression
(Mcleans’ and Hindel’s)
Campagna technique
Functional reline method

Selective pressure impression
Corrective impression technique
Anatomic form impression

One stage impression using elastic material and produce cast not represent functional relationship

Hard and soft tissues are recorded at rest
Indications

1. As a primary impression to obtain a primary cast
2. Indicated for tooth bonded edentulous areas
3. Class III, Class II with or without modification areas
Functional impression
As the bone is covered by mucosa and sub mucosa of varying thickness, the ability of these tissues to bear the load differs. Uneven distribution of loads results in functional instability and subsequent displacement.
When occlusal loads are applied to the tooth supported RPD, the teeth absorb the loads before transmission to the residual ridge.

So we just need to record the teeth & the soft tissue in their anatomic form.

In contrast, when loads are applied to the tooth tissue borne RPD, the occlusal forces are transmitted to both the residual ridge & abutment teeth. So it must be recorded in anatomic & functional form.
Technique to obtain a selective impression of the differential support offered by the free end saddle.
The objective is to obtain a displacive impression of the edentulous ridge under conditions which mimic functional loading.
Indications of the dual impression technique

- The dual impressions is most often indicated for Mandibular distal extension
- Long span anterior edentulous base (6 anterior teeth)
- In the maxilla the ridge is usually covered by firm well attached mucosa, so no need to this technique.
How to confirm it is needed??

1. acrylic resin bases are added to the frame work

2. The frame work are placed in the mouth & finger pressure are applied to the base, if the base can be depressed so that the indirect retainer or lingual plate lifts away from the teeth, dual technique is indicated.
Timing

- After framework construction
- After RPD construction
objectives

Physiologic impression techniques
Recorded the ridge portion in its functional form

Selective pressure impression technique
Direct the force to the portion of the ridge capable of withstand the occlusal load
Physiologic impression
Mc LEAN

McLean is the first proposed the need for physiologic impression

- Construct special tray in edentulous area
- Functional impression made from this tray
- Overall impression made while maintain functional impression in its intended position
Mclean’s method

Special tray for the edentulous areas

Impression for the distal extension

Overall impression
Disadvantages

1. The practitioner could not produce the same functional displacement as occlusal force
   Hindles’ modification on Mclean method: develop tray with large hole in their posterior segment

2. It accelerate the rate of the ridge resorption

3. If clasp retention is not sufficient the denture will be in occlusal position at rest i.e premature contact of teeth
Hindles’ modification on Mcleans’ technique

Oclussal rims constructed on the distal extension part of the special tray

The impression is taken with the pt occluding.
Campagna technique

Two special trays constructed, one for the edentulous areas, the other for the teeth remaining the arch.

Border molding for the distal extension
An impression for the remaining teeth.

Indications:
extremely mobile remaining teeth
Physiologic impression
functional relining method

After the partial denture has been completed
By adding a new surface to intaglio of denture base

1. Partial denture is constructed from single alginate impression
2. Space is provided between the denture base and the cast using metal spacer
3. Special tray constructed
Pt keep his mouth partially opened
4. Make impression with the frame using low fusing modeling plastic
5. Remove 1mm from modeling plastic and make final impression with zoe or poly sulfied
Corrected Cast Technique

- Altered Cast
- Modified Cast
Corrective Cast Impression technique

1. Adding special tray to the framework
Outline the edentulous distal extension areas

Ensure proper positioning of framework on the cast
Adapt mixed autopolymerized acrylic resin to the distal extension above the distal gridwork.

Remove sharp edges and smooth the borders.
Ensure proper placement, adequate space for border molding of the tray
Check Seating

• If not seated, remove, repeat
  ▫ Rests fully seated
  ▫ Tissue stop contacts cast
  ▫ Metal adjacent abutment contacts cast
  ▫ No resistance as framework seated
Correction of the peripheral extension

- 2-3 mm short of vestibular
- Two third of high of retomolar pad
- No displacement when:
  - Pull on cheeks, lips
  - Patient activates tongue
Border Molding

• The same as for complete denture
• In two steps
1. From anterior extent of buccal flange to the most posterior extent of the tray
2. On the lingual and disto lingual flange
Make corrected Cast Impression

Here relief is provided to create room for impression material
When the framework is placed in the mouth the impression is taken with finger pressure applied to the occlusal rests of the cobalt/chromium framework.
No pressure over imprison tray
framework rotate around occlusal rest
Remove & Inspect Impression

- Absence of voids
- Minimal burnthrough
- Covers supporting tissues
- Fully seated, etc.
The set impression is reseated on the master cast which has had the edentulous areas removed. The new impression is poured and the new cast is produced.
Send to Laboratory

- **Lab Steps**
  - Section residual ridge from cast
  - Ensure no contact between impression & cast
  - Place retentive grooves in cast
  - Sticky wax in place
Lab Steps

- Box impression
- Ensure water tight seal
- Seal retainer, major & minor connector borders
- Pour new ridge areas in different color stone
Problems with the corrected Cast Technique

- If tray is added carelessly, it can alter passive relationship
- Excess impression material under framework
- If inadequately sealed, stone over teeth, can’t articulate model
fluid wax functional impression

Materials
Fluid waxes:

Firm at room temp and flow in mouth temp

e.g. Iowa wax develop by Dr Ehler's smith
Korrecta wax No 4
Selective pressure impression

- Direct more force to portion of the ridge able to absorb stress and protect area least absorb stress

- Differs from the above 2 methods in that: selective relief of impression tray is to be done.
• The intalgio surface of tray upon the crest of the ridge relieved down to metal stratu
• Buccal shelf of bone is primary stress bearing area so slight relief indicate here
• Lingual slop also relief slightly
• To reduce excessive tissue displacement drill holes in tray
Impression Procedures for Partially edentulous Patients
1. Select a suitable size perforated tray for obtaining an initial impression.

2. modify the tray: Add wax or modeling compound in the tuberosity & palatal area for maxillary, or in the lingual flanges for a mandibular impression. The edentulous areas may also need modifications of the tray with impression compound.
Inserting the tray in the mouth

Stand behind (for maxillary) and in front of the patient (for mandibular) impression. Retract the cheek with the tray and with your free hand and rotate the tray in the mouth.
Then,

Retract the lip (upper or lower) and seat the tray anteriorly, centering it according to the frenum and the sulcus, and then posteriorly. Let the lip drape naturally and complete the border molding.

For lower impression – ask the patient to elevate the floor of the mouth, e.g., by licking his lips.
Muscle trimming of the borders
While waiting for the material to set

Hold the tray immobile for at least 3 minutes with a light finger pressure applied over the left and right pre–molar areas. **Any movement of the tray can cause an inaccurate impression.**
Once the material is set

Release the surface tension by lifting the lip (up or down) away from the tray.
Remove the impression quickly (snap removal) in line with the long axis of the teeth.
Rinse it thoroughly under running tap water – free it from saliva or blood.
Examine the impression carefully for acceptance and disinfect it before pouring.
An acceptable impression
Elastic materials should be used for primary & secondary impression.

Different suitable materials:

- Elastomers are capable to reproduce finer details and had a comparable high tear strength to that of hydrocolloids.
For the Final Impression

A better extended custom tray is normally fabricated on the diagnostic cast.
<table>
<thead>
<tr>
<th>Impression Material</th>
<th>Custom Tray specification</th>
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<tbody>
<tr>
<td>Silicone (condensation or addition)</td>
<td>• The tray should be 2mm shorter</td>
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<td></td>
<td>• Wax spacer on the edentulous area to accommodate material</td>
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<td></td>
<td>• Tissue stops to properly positioned intraorally</td>
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<tr>
<td>Poly sulphide</td>
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<tr>
<td>Poly ether</td>
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<td>Alginate</td>
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Why to have Tissue stops

The custom tray is fabricated to have tissue stops for accurate relocation of the tray and for achieving even thickness of the impression material. These stops are placed on the teeth other than abutments and on the edentulous ridge distally.
Tissue stops can be added intra-orally by applying green stick compound to the chosen location on the tray and then seating it in the mouth under gentle pressure.
Seat the patient in an upright position and check the tray border extensions. **For Class I & II it should cover the retromolar pad or maxillary tuberosity. Any overextensions should be relieved by trimming the tray, especially in the frenum areas.**
What to do!

Over-extended  Under-extended
Border molding

Is carried out in the areas adjacent to edentulous span and for the distal extension saddles. Areas were teeth are present needs no border molding unless under extended.

The border molding materials are: the tracing (green stick)/low fusing compound, silicone and poly eher.

Ensure proper tissue trimming specially in the lingual frenal area in order to determinr proper sulcus depth for proper selection of major connector.
Before making the impression

Remove the excessive saliva from the mouth with an ejector and dry the rest seat preparations and dimpling (if any) with an air syringe. An excessive drying should be avoided as the material may adhere to the dried tooth surface.
open inter-dental spaces could be occluded with soft wax prior to inserting the loaded tray,

otherwise the impression material will flow beneath the contact points and lock the impression in place and distortion will occur upon removal.
Mix the impression material by adding alginate powder to the desired amount of water – spatulate rapidly against the walls of the bowl for one minute, or

By mixing the catalyst and base components of the rubber base material uniformly.

Place the material in the tray, try to avoid entrapping air and lock the alginate in the perforations – for rubber base materials, an adhesive should be applied to the tray before mixing the material. Do not over – load the tray as the excess material may initiate the gag reflex.
For a bubble-free impression

Alginate should be wiped over the teeth and into the deep sulci with a finger immediately prior to inserting the loaded tray. The rubber base materials can be poured over the teeth using a syringe.
Now the unacceptable ones

Incorrect seating of the impression tray laterally.
Not Acceptable

In-complete seating of the impression tray – unsupported impression at the borders.
Repeat the Impression

Under extended tray – thin edge of unsupported impression of the posterior lingual sulcus.
Re-do border molding also

Over-extended border molding resulting in the distorted sulcus reflection in the impression.
Finally, an acceptable impression

A maxillary impression taken with combination of impression compound in the distal extension areas and overall alginate impression. Alginate has been cut off on one side to show its thickness.
McCracken’s Removable Partial Prosthodontics. Chapter 15.