Successful Outcomes in Contemporary Removable Prosthodontics: Clinical Complete Dentures
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Academy of General Dentistry

Review of Clinical and Laboratory Procedures for Complete Denture Prosthodontics

Complete Denture Success Depends on 3 Factors
- Accurate diagnosis and execution of the required technical procedures
- Meeting or exceeding the patient’s desires and expectations
- Establishing good doctor-patient communications that results in patient confidence

“Dr. Charles Goodacre, Dean - Loma Linda University”

Demographics: Average Lifespan

Demographics: Trends in Tooth Loss
Demographics:
Estimates of U.S. total adult and edentulous adult population

Demographics:
Estimates of U.S. total elderly (65+yrs.) and elderly edentulous in one or both jaws

Demographics:
Will there be a need for complete dentures in the United States in 2020? 
*Douglas et al., J Prosthet Dent 2002*

Complete dentures for all age groups from 25 to 85 years of age will increase from 33.6 million adults in 1991 to 37.9 million adults in 2020. The 10% decline in edentulism experienced each decade for the past 30 years will be more than offset by the 79% increase in the adult population older than 55 years.

Demographics:
Denture users in the adult population

Demographics:
*Redford et al., J Dent Res 1996*

Analysis of prosthodontic evaluation data indicate that approximately 60% of denture users have at least one problem with the denture.

Demographics:
Complete dentures in the prosthetic rehabilitation of the elderly persons; five different criteria to evaluate the need for replacement.
*Nevalainen et al., J Oral Rehabil 1997*

This study evaluated the complete dentures of 144 patients over 75 years old. They found that depending on the criteria used, between 10% and 80% of the dentures were in need of replacement.
Answers to the question, "what is your lab specialty?"

<table>
<thead>
<tr>
<th>Type</th>
<th>1999</th>
<th>2002</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial Dentures</td>
<td>8%</td>
<td>24%</td>
<td>+16%</td>
</tr>
<tr>
<td>Complete Dentures</td>
<td>18%</td>
<td>23%</td>
<td>+5%</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>2%</td>
<td>3%</td>
<td>+1%</td>
</tr>
<tr>
<td>Implants</td>
<td>3%</td>
<td>3%</td>
<td>0</td>
</tr>
<tr>
<td>Full Service</td>
<td>16%</td>
<td>16%</td>
<td>0</td>
</tr>
<tr>
<td>Crown &amp; Bridge</td>
<td>51%</td>
<td>49%</td>
<td>-2%</td>
</tr>
</tbody>
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“Treatment of edentulous patients will continue to be a challenge for the dental profession; therefore, dental schools must provide adequate dental education and training in complete denture prosthodontics for the foreseeable future.”

Demographics: Summary

Future needs for fixed and removable partial dentures in the United States

Douglas et al., J Prosthet Dent 2002

- The number of people in the United States who need complete dentures will increase over the next 20 years.
- Dental education programs and practitioners should consider the implications of these continuing patient needs.

Demographics:

- Despite all the shortcomings edentulous patients are quite satisfied with their complete dentures, only 5-20% of them are not.
  Van Waas, 1990
- Denture satisfaction is influenced by various factors, including denture quality, the denture bearing area available, the quality of dentist-patient interaction, previous denture experience and the patients personality & psychologic well being.
  Berg, 1991
- Outcome from the patient’s point of view is only in part related to technical aspects of the treatment modality
  Vervoorn, 1988; Van Waas, 1990

Demographics: Summary

Full Satisfied 66.7%
Moderately Satisfied 25.6%
Dissatisfied 7.7%

1st Clinical Appointment
-Baseline Evaluation

- Denture History
- Clinical Findings
- retention
- stability
- support

Successful Complete Dentures = Optimizing Retention, Stability & Support

Retention
- Peripheral Seal
  - palatal seal area
  - tongue position
  - border tissue attach.
  - functional mobility of the floor of the mouth
  - facial muscle tone
- Salivary Flow
  - character of saliva
  - amount of saliva

Stability
- Residual Ridge
  - height & contour
- Residual Ridge
  - relationship
- Residual Ridge
  - parallelism

Support
- Condition of Existing Dentures
- Size of Jaws
- Soft Tissues
- Max. or Mand. Tori
- Palatal Vault Form

Misc. Findings
- Interarch Space
- Tongue Size
- Lip Mobility & Length
- Anatomic Max.
- Ridge Prominence
- Radiographs

Retention-resistance to vertical dislodging forces

- Immediate Retention
  - Intimate Tissue Contact
  - Peripheral (border) Seal
  - Atmospheric Pressure

- Long Term Retention
  - Neuromuscular Control
Retention-resistance to vertical dislodging forces

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Stability-resistance to lateral forces

- Residual Ridge Height & Contour
- Residual Ridge Relationships
- Residual Ridge Parallelism

Residual Ridge Parallelism
- no ridge
- fair ridge
- good ridge

Residual Ridge Relationships
- Class II
- Class III
- Class I

Stability-resistance to lateral forces

- Residual Ridge Height & Contour
- Residual Ridge Relationships
- Residual Ridge Parallelism

Support-resistance to vertical seating forces

- Condition of Existing Dentures
- Size of Jaws
- Soft tissues
- Max. or Mand. Tori
- Palatal Vault Form
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**1st Clinical Appointment**

- Oral Examination

- Preliminary Impressions

- Normal
- Retained roots
- Embedded or impacted teeth
- Irregular spiny ridge
- Pathology local
- Pathology systemic
“The ideal impression must be in the mind of the dentist before it is in his hands.”

“He must literally make the impression rather than take it.”

M.M. De Van J. Prosthet. Dent. 2:26, 1952
Choosing Mandibular Tray

- Labial Frenum
- Labial Vestibule
- Buccal Frenum
- Buccal Vestibule
- Hamular Notch
- Posterior Palatal Seal Area
- Incisive Papilla
- Labial Frenum
Pour Preliminary Impressions

Preliminary Casts

Master Impression Trays
2nd Clinical Appointment
-Final Impressions

- Try-in Custom Trays
- Border Molding
- Final Impressions

Try Trays in the Mouth

Mark Posterior Palatal Seal
Trim Posterior Border

Border Molding Compound

Heat, Apply, Flame & Temper
Remove excess compound

Create Relief

Paint adhesive into tray
Rinse and Pack Gauze

Load Impression Tray

Seat Impression Tray

Remove and Inspect Impression

Trim Over-Extensions

Bead and Box Impressions
Pour in Vacuum Mixed Stone

Place in Warm Water

Inspect Master Casts

Store Casts in Clean, Dry Place

3rd Clinical Appointment
- Maxillomandibular Relations & Anterior Tooth Selection

- Establish Plane of Orientation
- Determine VDO
- Make C.R. Record
- Make Facebow Registration
- Select Anterior Teeth

Triad Record Bases
Block-out Undercuts Master Casts

Lubricate Casts & Process Record Bases

Attach Wax Occlusion Rims

Place Reference Marks

Adjust Maxillary Wax Occlusion Rim

Adjust Length of Wax Rim
Adjust Level of Maxillary Occlusal Plane

Determine Vertical Dimension of Occlusion

Adjust Mandibular Wax Rim to Vertical Dimension of Occlusion
Mark Mid-Line

Check Record Bases

Notch Maxillary Wax Rim

Remove 2mm From Mandibular Wax Rim

Adapt Aluwax to Wax Rim

Make Centric Relation Record
Remove and Inspect Record

Attach Bite Fork to Wax Rim

Attach Spring Bow and Align 3rd Point of Reference Indicator

Tighten Screws on Face Bow
Remove Face Bow with Bite Fork

Select Anterior Denture Teeth

Make Diagnostic Impressions of Old Denture

Dentsply TruRx Digital Denture Prescription
"...more than two thirds of subjects tested showed no similarity between face-form and incisor tooth form."

Mounting Master Casts

Attach Mounting Jig and Mounting Assembly to Articulator

Notch Master Casts
Quick Mount Maxillary Cast

Attach Mandibular Wax Record to Maxillary Wax Rim

Quick Mount Mandibular Cast

Dress Up Mountings

Verify Ridge Relationships

Set Anterior Teeth
Transfer Midline Mark to Cast

Set One Maxillary Central Incisor

Set the Other Central Incisor

Set Laterals and Cuspids

Make Guidelines to Set Mandibular Anterior Teeth
Set Mandibular Anterior Teeth

4th Clinical Appointment - Anterior Try-in
- Try-in Anterior Teeth
- Verify C.R.
- Make Protrusive Registration
- Select Posterior Teeth

Procedures for Anterior Tooth Try-in - preserve the centric relation record!

Try-in Teeth & Verify CR Record

Evaluate Tooth Length and Lip Support

Evaluate Phonetics
Obtain Patient approval

Make Protrusive Record

Hanau Formula: $H/8+12 = $ Lateral Condylar Inclination

Set Incisal Guide Table
Select Posterior Denture Teeth

Concepts of Occlusion
- Balanced Articulation
  “Anatomic”
- Non-Balanced Articulation
  “Neutrocentric or Monoplane”
- Lingualized Articulation

Balanced Articulation
“The stable simultaneous contact of opposing upper and lower teeth in centric relation position with a smooth bilateral gliding contact to any eccentric position within the normal range of mandibular function, developed to lessen or limit tipping or rotation of the denture bases in relation to the supporting structures.”

Cross-Tooth, Cross-Arch Balance

Hanau’s Quint
Five Factors Affecting Occlusal Balance
- Condylar Inclination
- Incisal Guidance
- Plane of Occlusion
- Cusp Height
- Compensating Curve
The Hanau Quint

C.I. + I.G. = P.O. + C.H. + C.C.

Bilateral Balanced Articulation

Non-Balanced Articulation

Lingualized Articulation

Obtain Artificial Denture Teeth

Set Artificial Posterior Denture Teeth
Mark Guidelines to Set Teeth

Set Posterior Denture Teeth

Set Posterior Denture Teeth

Complete Wax Contour

5th Clinical Appointment
-Posterior Try-in

- Try-in Posterior Teeth
- Verify VDO & C.R.
- Confirm Posterior Palatal Seal
- Select Denture Base Shade

Procedures for Posterior Tooth Try-in
Obtain Patient Approval

Mark Posterior Palatal Seal

Adjust Record Base

Mark Posterior Border on Cast

Trace Outline on Master Cast

Carve Posterior Palatal Seal
Carve Posterior Palatal Seal

Chose Denture Base Resin Shade

Chose Denture Base Resin Shade

Seal Record Bases to Master Casts

Check Occlusion

Check Occlusion
Process Complete Dentures

6th Clinical Appointment - Delivery of Complete Dentures

Laboratory Remount of Processed Dentures

Attach Dentures to Articulator
Observe Pin Opening

Adjust Centric Prematurities

Incisal Guide Pin Touches Table

Make Remount Index

Remount Index
Finish and Polish Dentures

Make Remount Cast

Make Remount Cast

Make Remount Cast

Mount Maxillary Remount Cast

Delivery of Complete Dentures
Inspect Intaglio of Dentures

Identify Blebs and Spicules

Obtain PIP Paste and Brush

Use Tongue Blade to Dispense

Paint PIP Paste Inside Denture
Insert Maxillary Denture

Alternate Seating Force Side to Side

Inspect “Pressure Areas”

Adjust Pressure Spots with Bur

Repeat Procedure 4 to 5 Times

Insert Mandibular Denture
Alternate Seating Force Side to Side

Inspect "Pressure Areas"

Adjust Pressure Spots with Bur

Repeat Procedure 4 to 5 Times

Clean PIP Paste from Denture

Seat Denture Bases
Adapt Aluwax to Mandibular Denture

Make New Centric Relation Record

Inspect Centric Relation Record

Make a Second C.R. Record

Place C.R. Record on Mandibular Denture

Attach Dentures to Remount Casts
Attach Remount Casts to Articulator

Inspect Mounting

Verify Mounting with Second Record

Start Clinical Remount Procedures

Mark Centric Prematurities
Check for Centric Prematurities

Note Heavy Contacts Between #’s 2 & 31

Achieve Even Posterior Contacts

Adjust Right Working Movement

Adjust Left Working Movement

Adjust Protrusive Movements
Evaluate Esthetics and Phonetics

Give Patient Instructions

Answer Patient’s Questions

Appointments #’s 7 to 9 • Post-Delivery Adjustments

Mark Sore Spot

Seat Denture
Adjust Pressure Spot with Bur

Verify Adjustment with PIP Paste

Adjusting Denture with “No Ulcer”