


**Successful Outcomes in Contemporary Removable Prosthodontics: Clinical Removable Partial Dentures**

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6/19/2015



**Academy**  
of General Dentistry

**Successful Outcomes in Clinical Removable Partial Dentures**

*Clinical Aspects-*

- Introduction
- Design Philosophy
- Biomechanics
- Simplified Component Selection
- Design Considerations
- Appointment Sequence
- Surveying
- Design Sequence
- Impressions “*Trouble Shooting*”
- Altered Cast vs. Reline
- Implants & RPD’s

**Best Approach to RPD Design**


“There are over 65,534 partially edentulous situations per arch meaning there are literally tens of thousands of potential RPD designs.” Beaumont, A. J. Micro-computer aided removable partial denture design, the next evolution. JPD 62:551-6, 1989

**Best Approach to RPD Design**

- ✓ Identify biomechanical classification of partially edentulous arch
- ✓ Design should satisfy biomechanical requirements of tooth borne vs. tooth & tissue borne removable partial dentures
- ✓ Utilize a small number of well designed components whose selection is based on sound biomechanical principles

**RPD Design Philosophy**


- ✓ Minimal tooth and minimal gingival coverage
- ✓ Equitable distribution of functional forces



Tooth Borne RPD
Tooth & Tissue Borne RPD

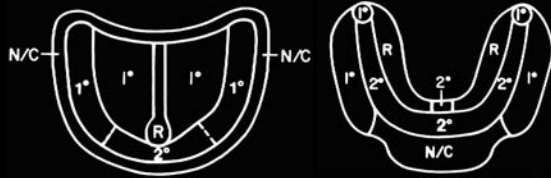
**Major Connector Selection**

- ✓ mandibular arch: lingual vestibular depth
- ✓ maxillary arch: requirement for support
- ✓ need for contingency planning



Tooth Borne RPD
Tooth & Tissue Borne RPD

## Primary Supporting Areas



## Clasp Selection

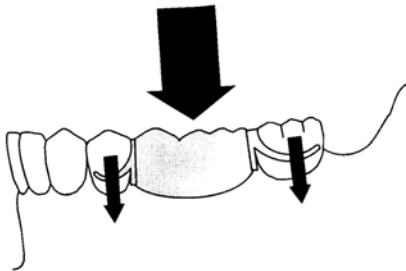
✓ need for stress release anterior to the fulcrum line axis



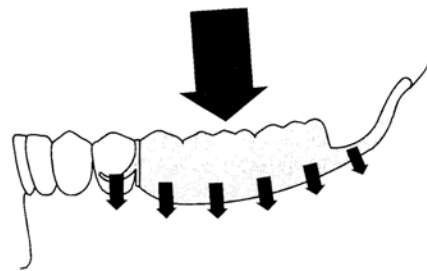
Tooth Borne RPD

Tooth & Tissue Borne RPD

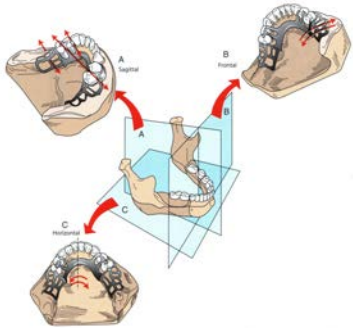
## Tooth Borne RPD's



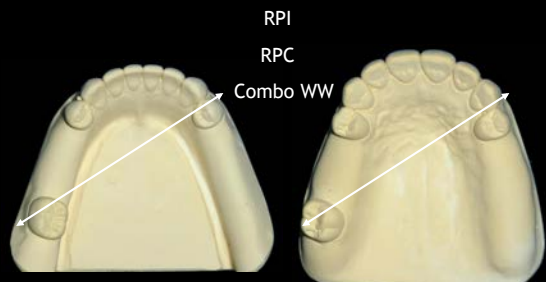
## Tooth & Tissue Borne RPD's



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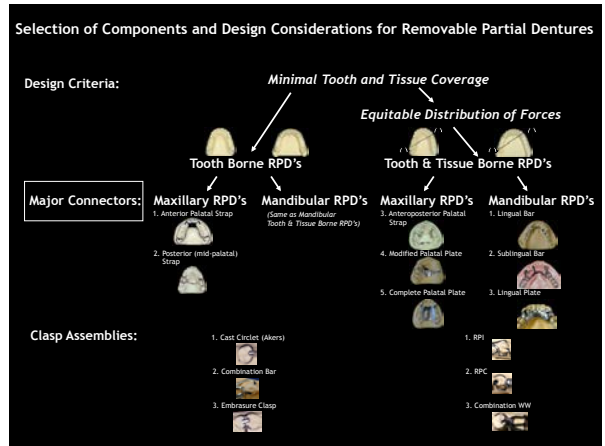
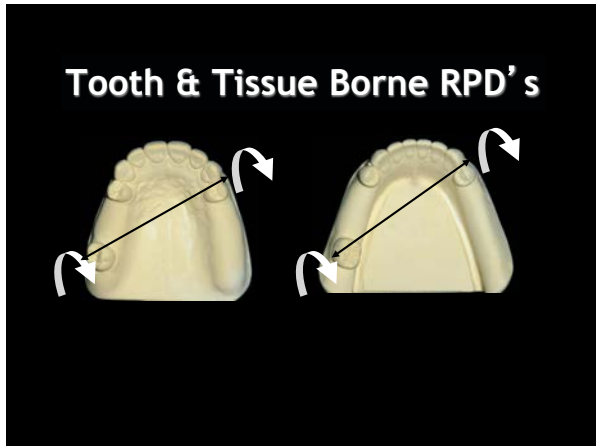
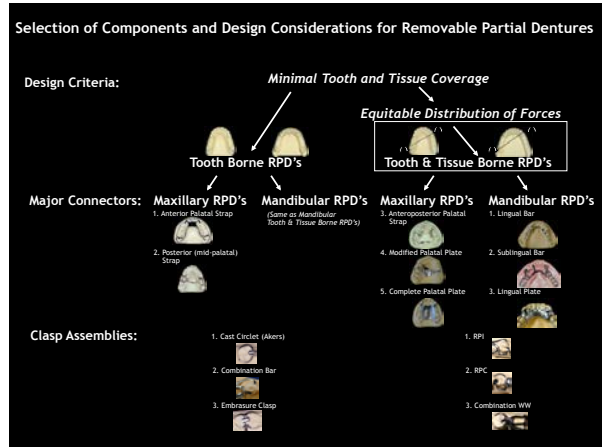
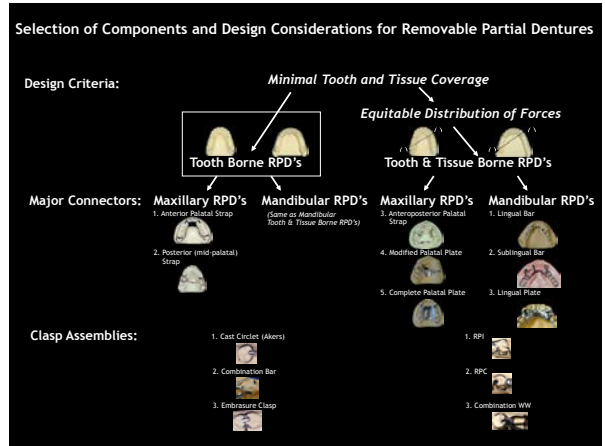
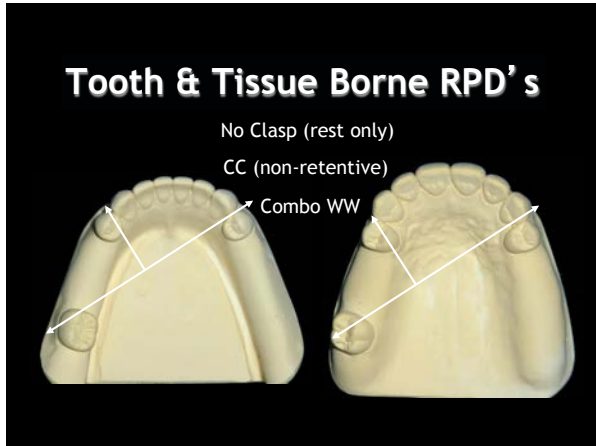
## Tooth & Tissue Borne RPD's



RPI

RPC

Combo WW

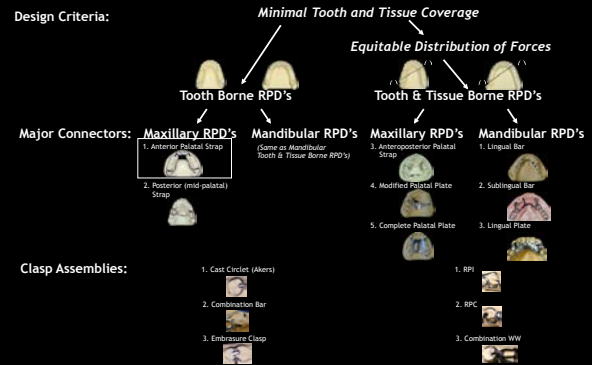


## Requirements of Major Connectors

- Sufficiency Rigid
- Properly Located
- Must Not Impinge on the Gingiva



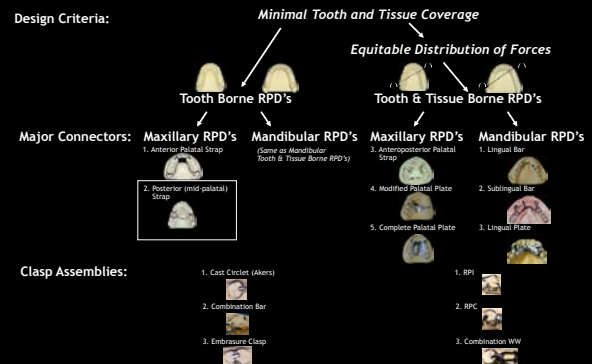
## Selection of Components and Design Considerations for Removable Partial Dentures



## Maxillary Major Connectors 1. Anterior Palatal Strap



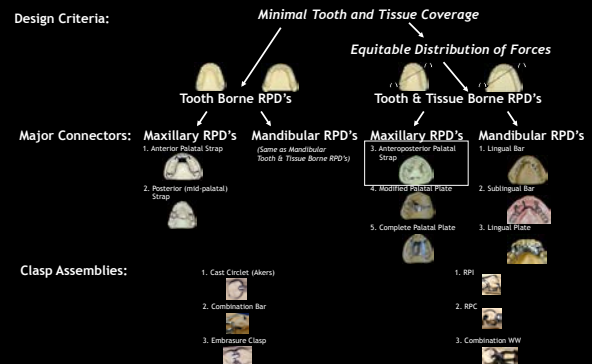
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## Maxillary Major Connectors 2. Posterior (mid-palatal) Strap



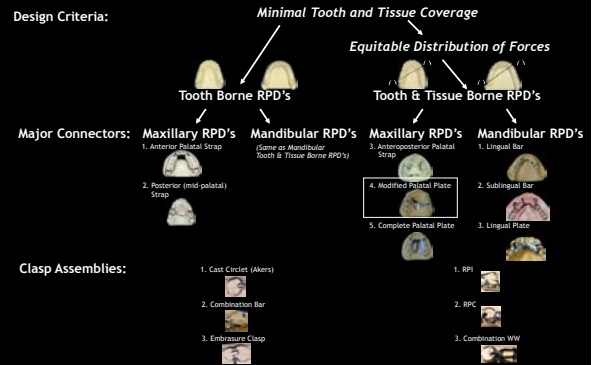
## Selection of Components and Design Considerations for Removable Partial Dentures



### Maxillary Major Connectors 3. Anteroposterior Palatal Strap



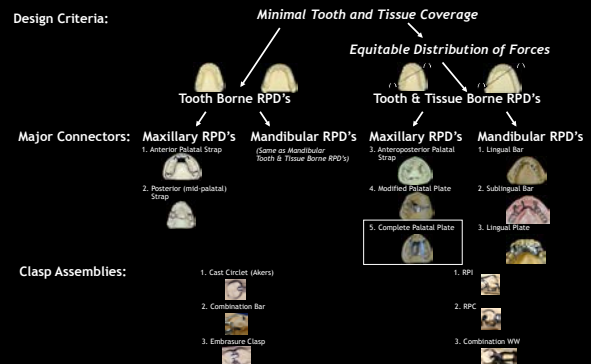
#### Selection of Components and Design Considerations for Removable Partial Dentures



### Maxillary Major Connectors 4. Modified Palatal Plate



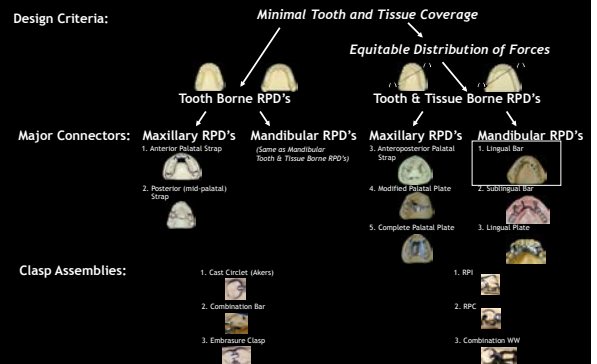
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### Maxillary Major Connectors 5. Complete Palatal Plate



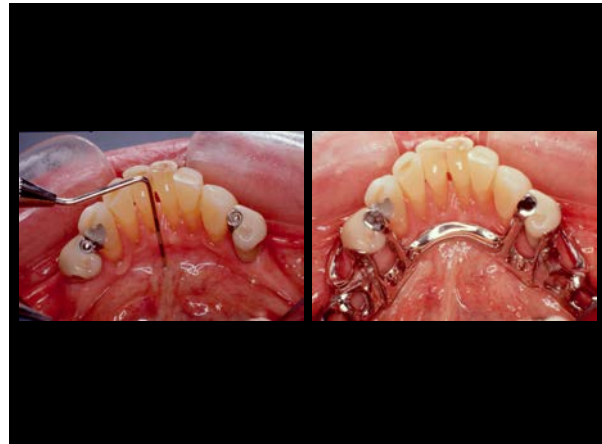
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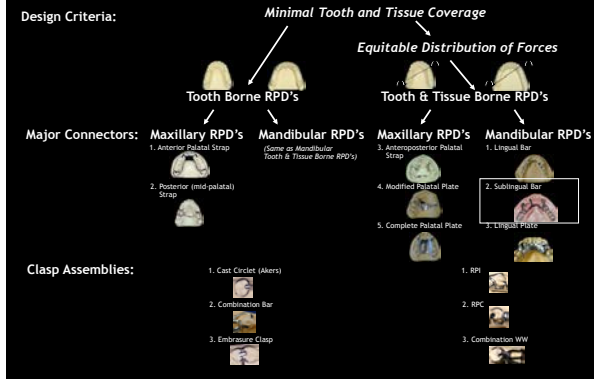


# Mandibular Major Connectors

## 1. Lingual Bar



### Selection of Components and Design Considerations for Removable Partial Dentures

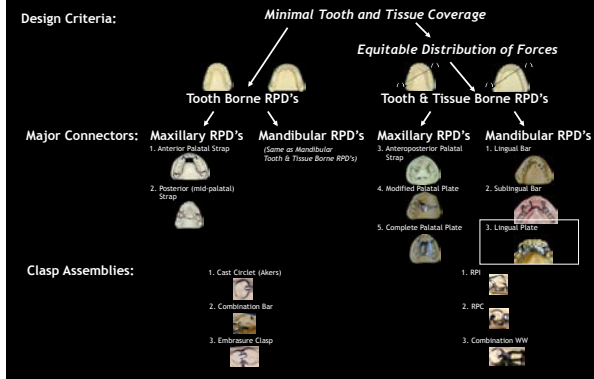


# Mandibular Major Connectors

## 2. Sublingual Bar



### Selection of Components and Design Considerations for Removable Partial Dentures

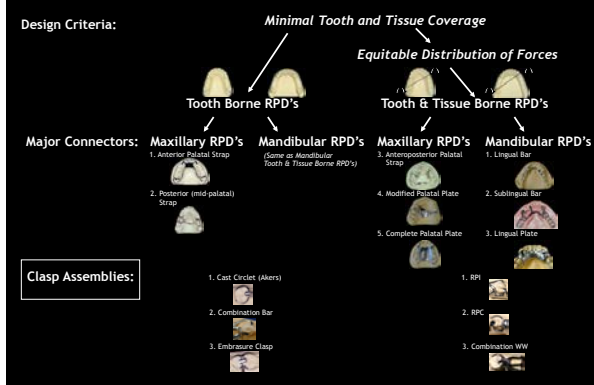


# Mandibular Major Connectors

## 3. Lingual Plate

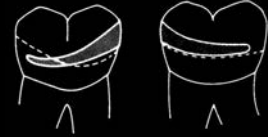


### Selection of Components and Design Considerations for Removable Partial Dentures



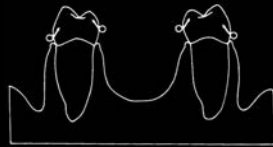
### Requirements of a Clasp Assembly

- ✓ Retention
- ✓ Stability
- ✓ Support
- ✓ Reciprocation
- ✓ Adequate Encirclement
- ✓ Passivity



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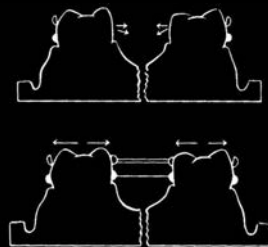
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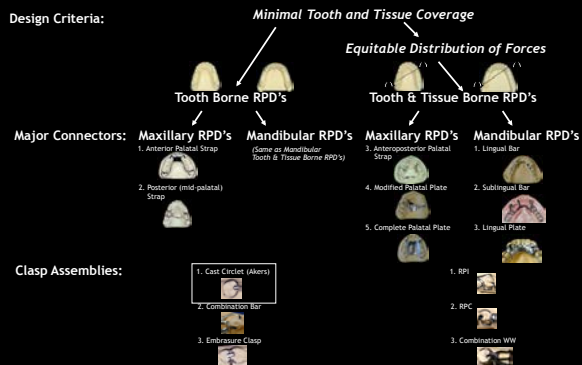


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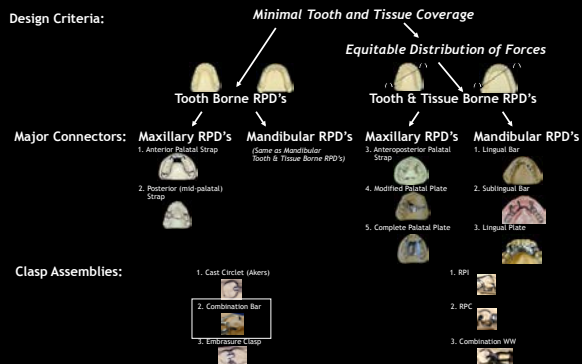
## Selection of Components and Design Considerations for Removable Partial Dentures



## Clasp Assemblies - Tooth Borne 1. Cast Circlet (Akers) Clasp



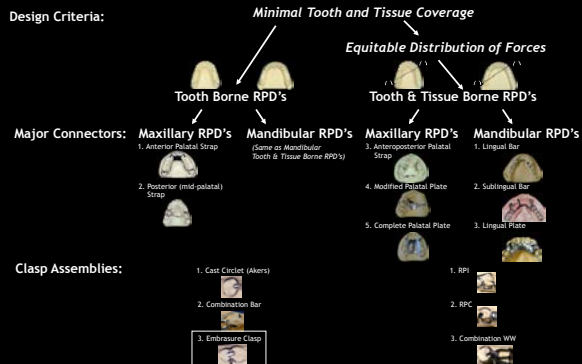
## Selection of Components and Design Considerations for Removable Partial Dentures



## Clasp Assemblies - Tooth Borne 2. Combination Bar



## Selection of Components and Design Considerations for Removable Partial Dentures

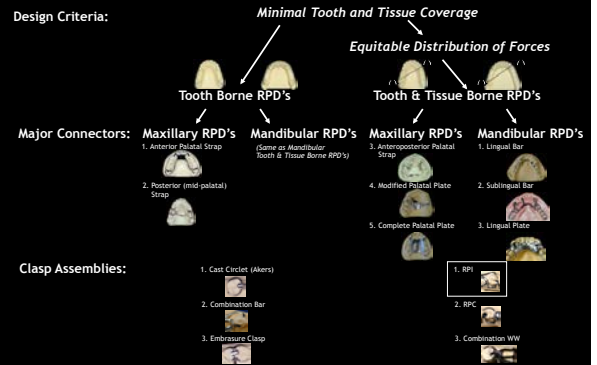




## Clasp Assemblies - *Tooth Borne* 3. Embrasure Clasp



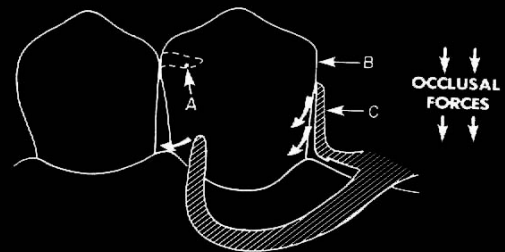
## Selection of Components and Design Considerations for Removable Partial Dentures



## Clasp Assemblies - *Tooth & Tissue Borne* 1. RPI Clasp

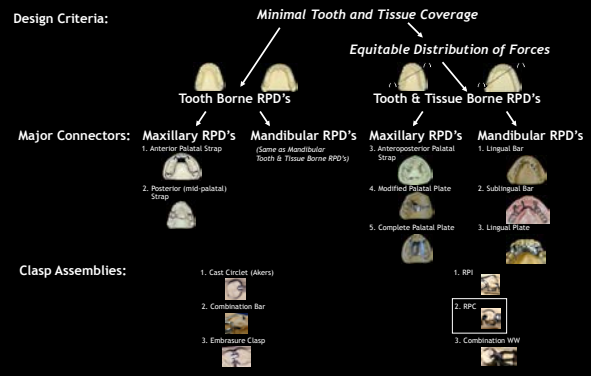


## RPI Clasp



## Functional Movement of the RPI Clasp

## Selection of Components and Design Considerations for Removable Partial Dentures

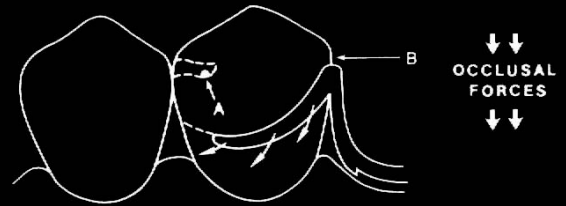


## Clasp Assemblies - Tooth & Tissue Borne

### 2. RPC Clasp

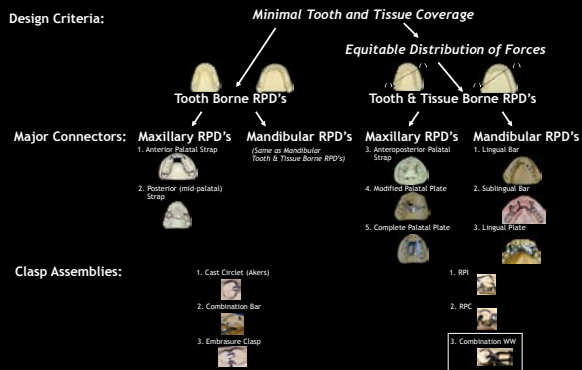


## RPC Clasp



## Selection of Components and Design Considerations for Removable Partial Dentures

Design Criteria:

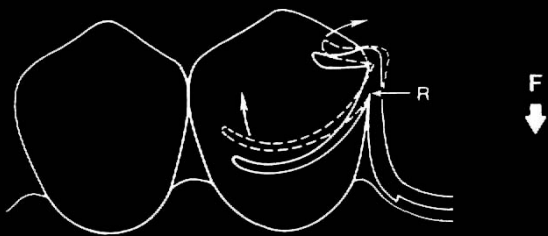


## Clasp Assemblies - Tooth & Tissue Borne

### 3. Combination Wrought Wire Clasp

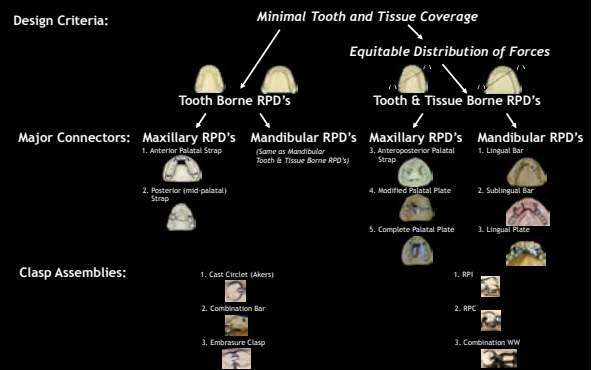


## Combination WW Clasp



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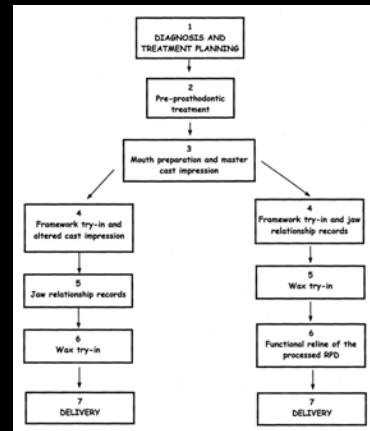






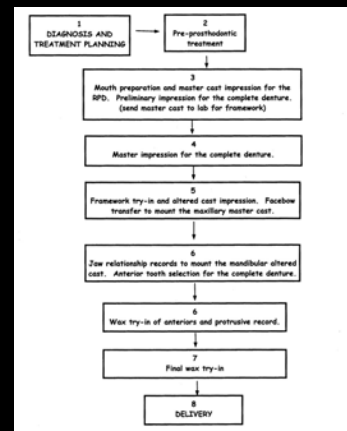
## Introduction

- ✓ Intake Interview & Clinical Assessment
- ✓ PARP Form
- ✓ Treatment Planning & Clinic Forms
- ✓ Treatment Sequence for RPD's
  - tooth borne RPD's
  - **tooth mucosa borne RPD's**
  - combination C/D & RPD



## Introduction

- ✓ Intake Interview & Clinical Assessment
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  - **combination C/D & RPD**



## 1<sup>st</sup> Clinical Appointment -Evaluation for RPD's

- ✓ Clinical Assessment
- ✓ Making Diagnostic Cast Impressions



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### **-Getting Casts Ready for Mounting**

- ✓ Making Record Bases
- ✓ Placing Wax Rims



### **-Getting Casts Ready for Mounting**

- ✓ Making Record Bases
- ✓ Placing Wax Rims



### **2<sup>nd</sup> Clinical Appointment -Recording Maxillomandibular Relations**

- ✓ Interocclusal Record
- ✓ Facebow Transfer







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## -Cast Mounting & Framework Design

- ✓ Mount Maxillary Cast
- ✓ Mount Mandibular Cast
- ✓ Design RPD's
- ✓ Record Design



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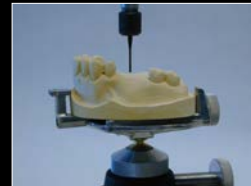
## -Cast Mounting & Framework Design

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## The Survey & Design Sequence for RPD's

- ✓ Survey Cast
- ✓ Rests & Minor Con.
- ✓ Major Connector
- ✓ Clasp Arms
- ✓ Retentive Network
- ✓ Ext. Finish Lines
- ✓ Int. Finish Lines
- ✓ Fill Out Forms



## Definitions:

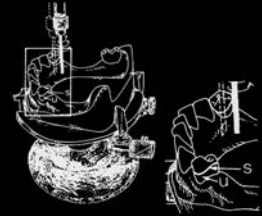


**Dental Surveyor** - A Paralleling instrument used in the fabrication of a Removable Partial Denture.

**Surveying** - The procedure of analyzing and delineating the contours of the abutment teeth and associated structures before designing a Removable Partial Denture.

## The Survey Process:

- ✓ Secure cast to neutral tilt
- ✓ Identify guiding planes
- ✓ Adjust anteroposterior tilt
- ✓ Identify potential undercuts
- ✓ Adjust mediolateral tilt
- ✓ Index the cast
- ✓ Draw survey lines
- ✓ Mark depth of undercuts
- ✓ Indicate modification areas
- ✓ Draw design



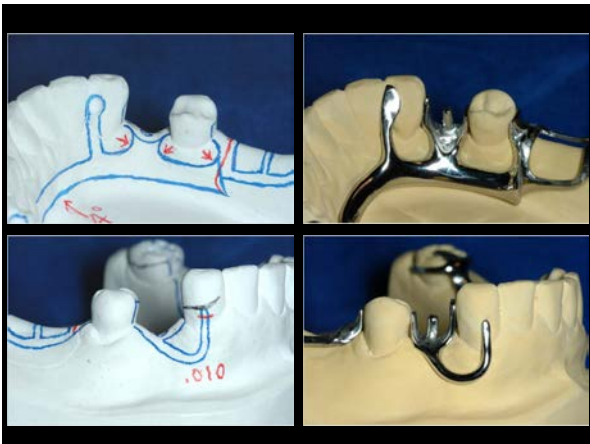
## The Survey & Design Sequence for RPD's

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## -Cast Mounting & Framework Design

- ✓ Mount Maxillary Cast
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- ✓ Design RPD's
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## 3<sup>rd</sup> Clinical Appointment

### -Rest Seat Prep. & Master Impressions

- ✓ Rest Seat Preparation
- ✓ Master Impressions



## Mouth Preparation for RPD's

- ✓ Diamonds
- ✓ Burs
- ✓ Polishing Instruments



## Modifications of Tooth Contour Sequence of Treatment

- ✓ Guiding Planes
- ✓ Height of Contour
- ✓ Retentive Grooves
- ✓ Rest Seats



## Review of Mouth Preparation with Patient

- ✓ Patient's Study Cast with Design
- ✓ Models



## Problem:

- ✓ Lack of Proper Mouth Preparation



## Solutions:

1. Mouth preparation check list
2. Verify tooth modifications before final impressions
  - ✓ Alginate Impressions
  - ✓ Quick Set Stone



## Final Impressions for RPD's



## Trouble Shooting Removable Partial Denture Framework Misfits

- ✓ Framework Does Not Fit Cast
- ✓ Framework Does Not Fit Mouth

## Framework Does Not Fit Cast

- ✓ Casting Inaccuracies
- ✓ Damage During Finishing

## Framework Does Not Fit Mouth

- ✓ Impression Errors
  1. Improper Tray Selection
  2. Impression Materials/Technique Error
- ✓ Distorted Cast
- ✓ Tooth Movement

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## Alginate Impressions

### Alginate Trays

- ✓ Stock or Custom
- ✓ Plastic or Metal
- ✓ Rimlock or Perforated

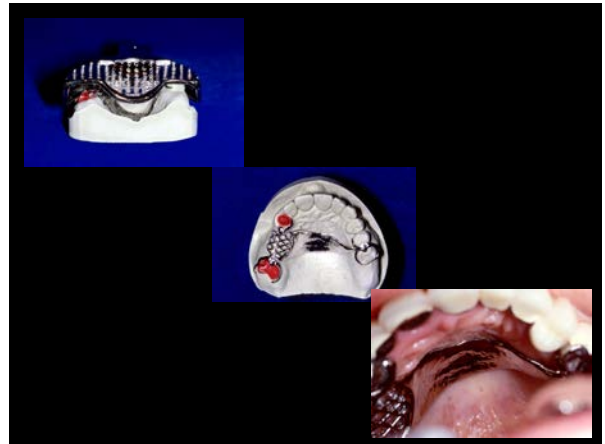


## Tray Selection for Alginate Impressions

1. Rigid Tray (metal or plastic)
2. Perforated for Alginate Retention
3. 4 - 8 mm of Relief (space)

### Notes:

- a. Rimlock type trays require use of an adhesive
- b. Maxillary trays may require modification of palatal vault
- c. Use an alginate adhesive on any tray where alginate retention is questionable
- d. Custom trays usually provide more even relief



**Intraoral Technique:**

1. Block out large interproximal spaces (undercuts)
2. Wipe alginate onto critical areas (e.g. rest seats, palatal vault and areas of framework contact)
3. Seat tray accurately in mouth
4. Hold tray in position for several minutes after initial set
5. Remove tray quickly with a “snap”
6. Inspect impression for desired detail/artifacts
7. Apply disinfection spray



## Alginate Manipulation

1. Follow manufacturer's recommendations for
  - a. Water : Powder Ratio
  - b. Spatulation Times

### Notes:

1. *Slight variations in water : powder ratio are permissible*
2. *Mechanical mixers may produce more consistent mixes*

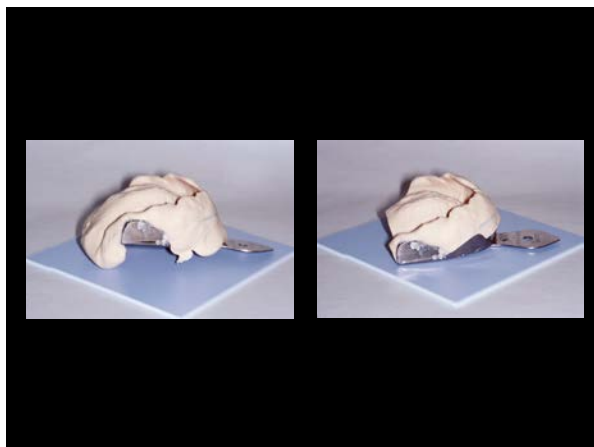


## Laboratory

1. Pour impression as soon as possible
2. Store in atmosphere of 100% humidity until poured
3. Pour with vacuum mixed die stone
4. Do not invert impression after pouring with stone
5. Avoid pressure on alginate ("cut off heels")

### Notes:

- a. *Liquids to improve surface hardness may be used*
- b. *Match stone with alginate for compatibility*



## -Master Cast, Framework & Custom Trays

- ✓ Bead, Box & Pour Master Cast
- ✓ Design Master Cast
- ✓ Send to Laboratory
- ✓ Examine Framework & Make Custom Tray for Altered Cast









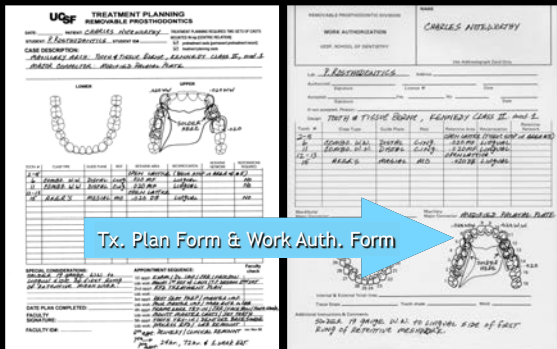
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**Tx. Plan Form & Work Auth. Form**

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**-Master Cast, Framework & Custom Trays**

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**4th Clinical Appointment**

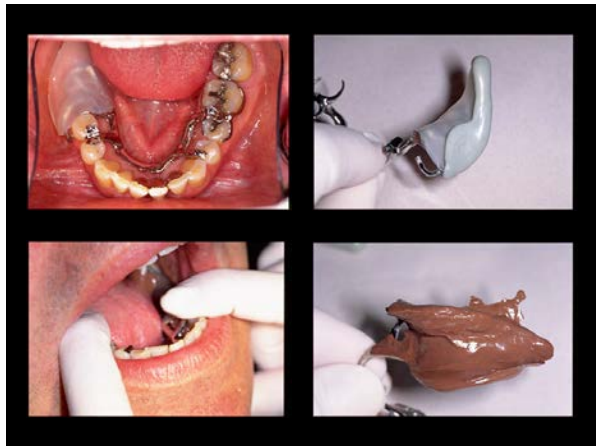
**-Frame Try-in & Altered Cast Impression**

- ✓ Framework Try-in
- ✓ Making Altered Cast Impression

**4th Clinical Appointment**

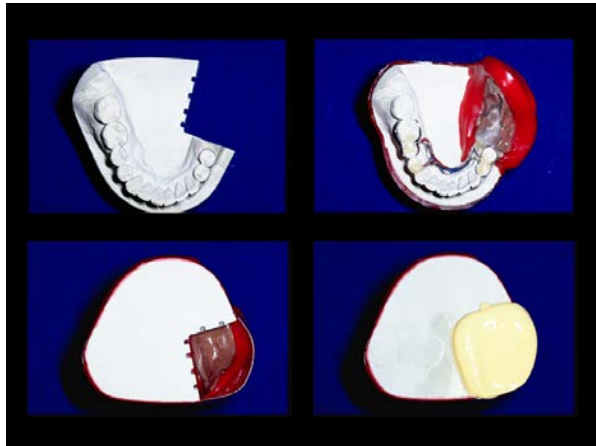
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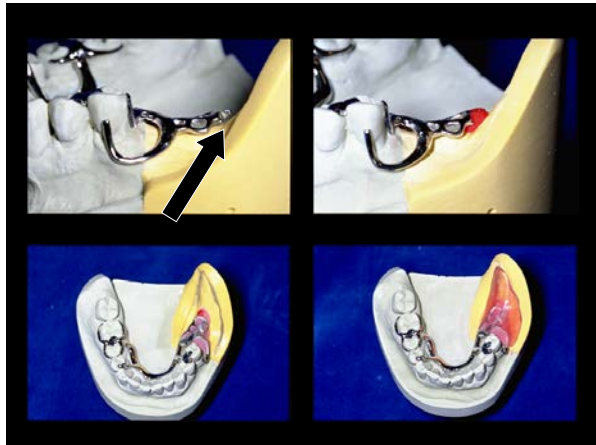
**-Making the Altered Cast and Record Bases**

- ✓ Making the Altered Cast
- ✓ Making the Record Bases



### -Making the Altered Cast and Record Bases

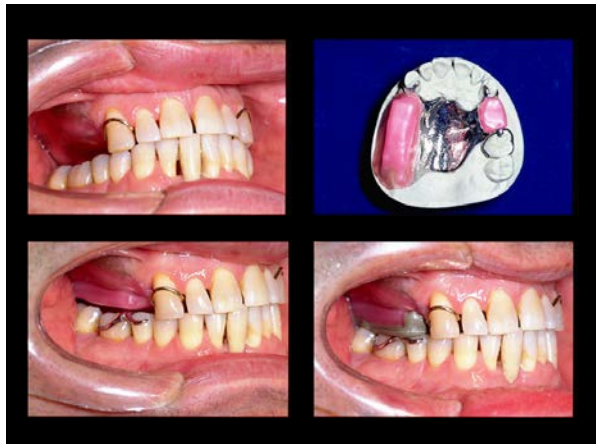
- ✓ Making the Altered Cast
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### 5th Clinical Appointment

#### -JRR, Facebow & Shade Selection

- ✓ Maxillomandibular Relationship Records
- ✓ Facebow Transfer
- ✓ Tooth Shade Selection



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#### -JRR, Facebow & Shade Selection

- ✓ Maxillomandibular Relationship Records
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## 5<sup>th</sup> Clinical Appointment -JRR, Facebow & Shade Selection

- ✓ Maxillomandibular Relationship Records
- ✓ Facebow Transfer
- ✓ Tooth Shade Selection



## -Mounting Casts, Tooth Selection & Set-up

- ✓ Mounting the Master Casts
- ✓ Selecting Teeth
- ✓ Setting Teeth



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## 6<sup>th</sup> Clinical Appointment -The Complete Wax Try-in

- ✓ Try-in Set-Up
- ✓ Verify JRR
- ✓ Selection Resin Shade



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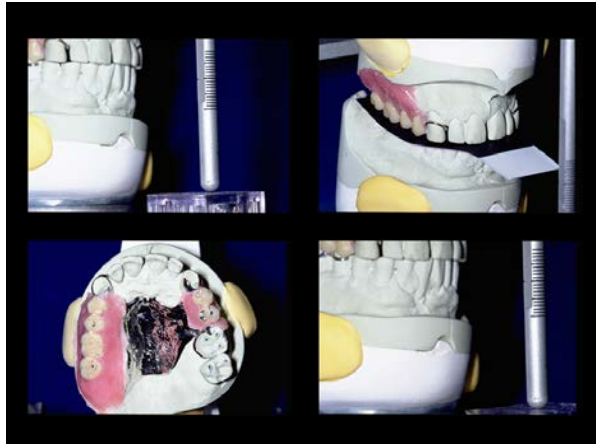
### -Processing RPD's Before Delivery

- ✓ Prepare RPD's for Processing
- ✓ Laboratory Remount
- ✓ Finishing & Polishing



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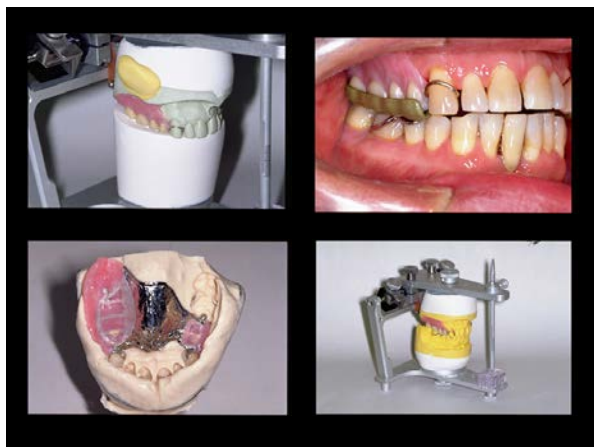
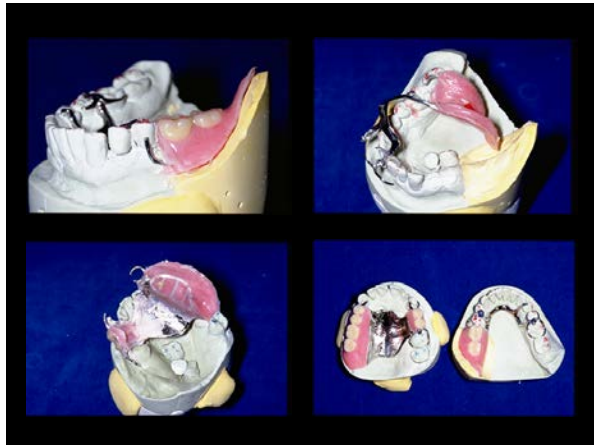
## 7<sup>th</sup> Clinical Appointment -Delivery & Clinical Remount of RPD's

- ✓ Try-in
- ✓ Clinical Remount
- ✓ Delivery



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- ✓ Clinical Remount
- ✓ Delivery

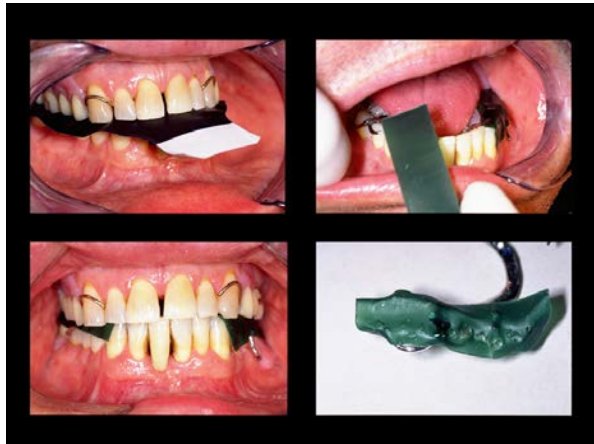


## 7<sup>th</sup> Clinical Appointment -Delivery & Clinical Remount of RPD's

- ✓ Try-in
- ✓ Clinical Remount
- ✓ Delivery







**8th-10th Clinical Appointments**  
**-Post Delivery Adjustments of the RPD**

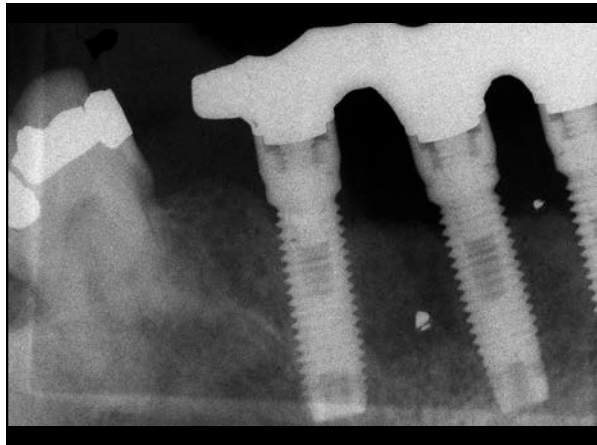
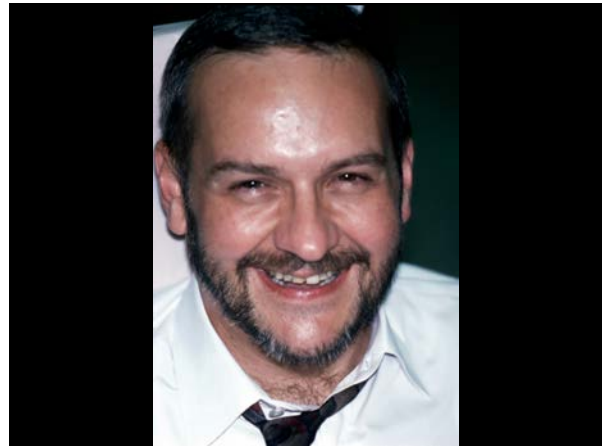
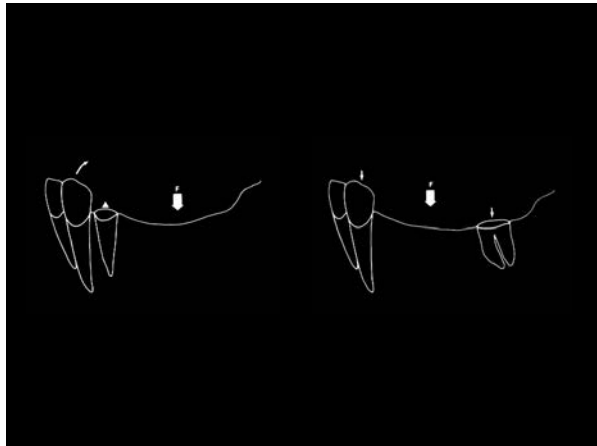
✓ 24, 72 Hour & One Week Adjustments




**Implant Borne “Supported”  
 Removable Partial Dentures**

**Implant Borne “Supported”  
 Removable Partial Dentures**

- ✓ Need to Replace Hard and Soft Tissue
- ✓ Limited Number/Location of Implants
- ✓ Enhanced Support, Stability & Retention
- ✓ Eliminate the Extension Base
- ✓ Reduce/Eliminate Visible Clasp Arms

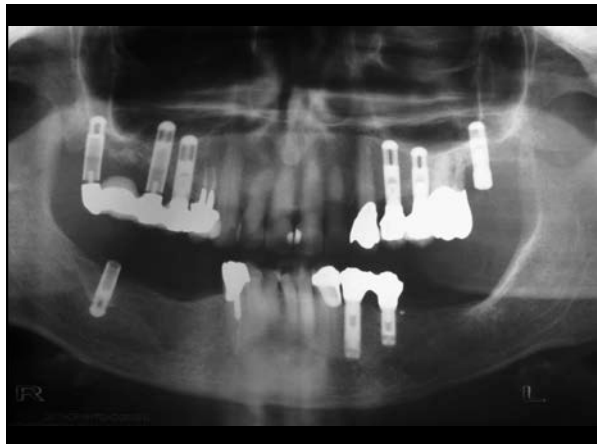
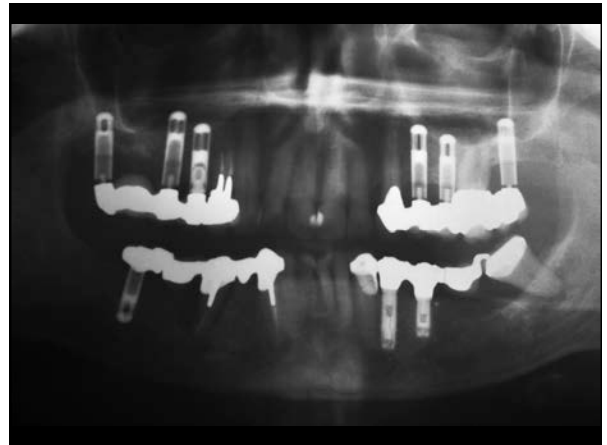


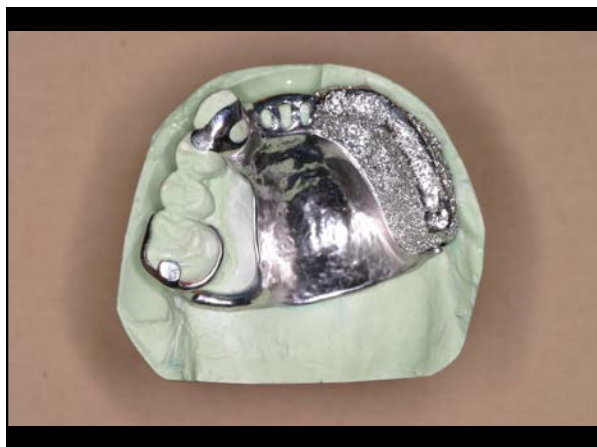
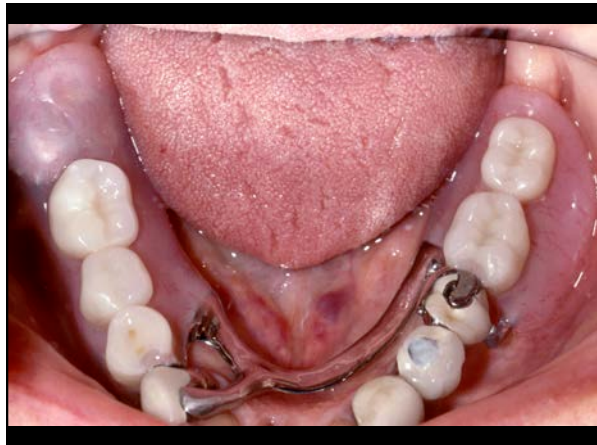


















## Implant Borne “Supported” Removable Partial Dentures

- ✓ Increased expenses: Surgical & prosthetic
- ✓ Adequate interarch distance!!!
  - ✓ Attachment height requirements vary
- ✓ Limited path of placement
- ✓ Maintenance considerations