Improve Your Partials:
Simple Materials, Techniques and Designs

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About Your Speaker:

M. Nader Sharifi, D.D.S., M.S. holds a certificate in prosthodontics and a masters degree in biomaterials from Northwestern University. He received his dental education at the University of Illinois. He has presented numerous topics on implant dentistry since his graduation. His presentations on restorative dentistry and patient care have earned him recognition from esteemed study groups, societies and associations nationwide. Dr. Sharifi is a former assistant professor at Northwestern University and former on-call consultant for Nobel Biocare.

Dr. Sharifi currently maintains a full-time private practice of adult general dentistry in Chicago’s downtown loop. As a five day a week wet gloved dentist, he is interested in ensuring time saving and cost effective care. In 1996 he was named to the American Dental Associations Speakers Bureau and in 2007 Chicago Dental Society honored him with the Gordon Christenson Distinguished Lecturer Award. He has also been honored with Fellowship in the American College of Dentists and Membership in the American Academy of Restorative Dentistry.

If you would like, you may find additional information regarding other courses and additional handouts on his website at www.DrSharifi.com. If you have interest in the live denture course where CORE provides the patient send an inquiry email to LiveDentureCourse@DrSharifi.com. Please feel free to direct any other questions or comments you may have to Dr. Sharifi’s personal Email address at MNSDDSMS@AOL.com.

About this handout: This handout isn’t meant to follow along slide for slide to the program today. It does somewhat, but this is more meant to be a resource in the future as you encounter these cases. This handout is written in such a manner that it can be used as a step-by-step guide when treating removable cases in your office.
Removable Prosthodontic Classification
M. Nader Sharifi, D.D.S., M.S.


A. Class I
1. Edentulous area in a single arch only.
2. Edentulism limited to 2 teeth in the maxillary anterior – or – 4 in the mandibular anterior – or 2 in the posterior (molars excluded).
3. Abutments are ideal and require no restoration.
4. Angle Class I jaw classification.
5. High, well rounded residual ridge.

B. Class II
1. Edentulous areas can exist in both arches.
2. Edentulism limited to 2 teeth in the maxillary anterior – or – 4 in the mandibular anterior – or 2 in the posterior (molars excluded).
3. Abutments or occlusion requires mild intervention.
4. Angle Class I jaw classification.
5. High or low, well rounded residual ridge.
6. Mild systemic or psychological modifiers.

C. Class III
1. Edentulous areas can exist in both arches.
2. Edentulism of more than 3 teeth in any area or 2 molars.
3. Abutments or occlusion requires moderate therapy.
4. Angle Class I, II or III jaw classification.
5. Occlusion is compromised with supra-eruption.
6. Moderate systemic or psychological modifiers.

D. Class IV
1. Edentulous areas can exist in both arches.
2. Edentulism of more than 3 teeth in any area or 2 molars.
4. Angle Class I, II or III jaw classification.
5. Occlusion requires a change in vertical dimension.
6. Severe systemic or psychological modifiers.
8. Maxillary-mandibular incoordination (Parkinson’s)
Patient Name_________________________Social Security Number_________Date________

Prosthetic Findings

Maxillary Arch: U Shaped _____ V Shaped ________ O Shaped ___ Square Shaped _____

Ridges: High _____ Low _______ Post-extraction_____ Knife-edged ______ Basal bone___

Hard Palate: Deep_______Shallow _____ Medium______ Soft Palate Class________

Tuberosities (R) ________(L) _______ Torus ________ Attached Mucosa ______% 

Frenum: Anterior ______ (R) _______ (L) _______ Teeth ____________________________

Mandibular Arch: U Shaped _____ V Shaped ________ O Shaped ___ Square Shaped _____

Ridges: High _____ Low _______ Post-extraction_____ Knife-edged ______ Basal bone___

Lateral Throat Form Class_______ Torus _____________ Attached Mucosa ______% 

Buccal Shelf: Large_______ Medium_________ Small_______

Frenum: Anterior ______ (R) _______ (L) _______ Teeth ____________________________

Tongue: Position________________________ Movement________________________ 

Saliva Consistency_____________________ Amount__________________________ 

Jaw Classification: Class I _________ Class II __________ Class III ____________ 

Existing Prosthesis: _____________________ Pt.’s Opinion: ________________________

Retention: Good____ Adequate _______ Poor________

Stability: Good____ Adequate _______ Poor________

Support: Good____ Adequate _______ Poor________

Esthetics: Good____ Adequate _______ Poor________

Phonetics: Good____ Adequate _______ Poor________

Occlusion: Good____ Adequate _______ Poor________

Facial Shape: Square____ Square-tapering____ Ovoid_______ Triangular __ Round ______

Profile: Flat_______ Rounded ________ Inverted__________

Coloring: Hair_______ Eyes ________ Complexion_____________

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Course Outline: Complete Course on Partial Dentures

I. Definition of an Overdenture – I know, it’s a partial course, but this is the base.
   A. Implant Retained Overdenture – A patient removable prosthesis that receives retention and limited stability from retained roots [natural or man-made (implants)]. Support should come from the hard and soft tissue of the denture bearing mucosa, not just the natural or man-made roots.
      1. Typically fewer implants – concentrated in the anterior
   B. Implant Supported Overdenture – Patient Removable Fixed Bridge – A prosthesis that is fixed in place with attachments and locks, yet is removable by the patient for hygiene access. The natural or man-made roots provide all retention, stability and support – just like a fixed bridge. The denture bearing mucosa provides no support what so ever.
      1. Requires more implants – placed under anterior and posterior teeth

II. Partial Dentures, Attachment Retained RPDs and Implant Assisted RPDs
   A. Implants or Attachments may be added, but basic design remains
      1. Keep Guide Planes and Rest Seats
      2. Only Change Attachments on C&B or Implants for Clasps
   B. Implant Ideal Locations: Canines and 2nd Molars
      1. Attachments in the 2nd Molar are Rotational to Seat the Frame
      2. Attachments within the Saddle are Resilient to allow Frame to Seat
   C. Avoid Attaching RPDs to Implant Retained Crowns – Only “Overpartials”
   D. With this entire Handout – Attachments are Treated the exact same regardless if they are on implants or a part of your crown and bridge restorations.

II. Kennedy Classification (Visual Learning)
   A. Class I – Bilateral Distal Extensions. Can also have anterior modification
   B. Class II – Unilateral Extension. Can have anterior or posterior modifications
   C. Class III – Tooth Borne Posterior Edentulous. Can have additional posterior or an anterior Modification.
   D. Class IV – Anterior Tooth Borne. Never has modifications.

III. Patient Evaluation
   A. Partially Edentulous Case Classification - See Page 2
   B. Anatomic Limitations – Problems with removable prosthodontic success related to the clinical situation of the patient. Changes can only be achieved with surgical correction. (See Exam Sheet Pg 3)

IV. Removable Partial Denture Requirements – Retention, Stability, Support, Esthetics, Phonetics and Occlusion
   A. Retention – Clasp Arms and Attachments
   B. Stability – Guide Planes and Major Connector
   C. Support – Rest Seats, Major Connector and Saddles
   D. Esthetics, Phonetics and Occlusion – Denture Teeth
V. Removable Partial Denture Components

A. Guide Planes – Horizontal stop (lateral) is secondary requirement of the remaining tooth in RPD design.
   1. Indication for Guide Planes – Path of insertion, stability.
   3. Anterior versus Posterior Path of Insertion.
      a) Eliminate one or the other with C&B or Implants
      b) Or...apply posterior to anterior – check papilla areas

B. Reason for Rest Preps – Vertical stop is primary requirement of the remaining tooth for RPD design. Creates the Fulcrum line.
   a) Shares Saddle Forces With Existing Teeth
   b) Identifies Complete Seating of Prosthesis
   c) Keeps the Direction of Force Down Long Axis
   d) Can Create More than 180º encirclement
   e) Provides Indirect Retention

2. Rests for Cuspids
   a) Cingulum (Chevron) Rest
   b) Horizontal Rest – Fill exposed dentin with composite
   c) Finger Rest – No Vertical Stop – Indirect rest only

3. Rests for Premolars and Molars
   a) Occlusal Rest – accentuating the mesial or distal pit

C. Indirect Retention
   1. Prevention of Saddle Area Lifting for Free-End Saddles
   2. Preparation – Tooth appropriate.
   3. Fulcrum Selection –
      a) Combine most distal REST SEATS.
      b) Greatest perpendicular placement – contralaterally.
      c) Required for Kennedy Class I and II
      d) Necessary for Tooth Borne?
         (1) Yes, Class III can act like a free-end (Class II)
         (2) Class IV is really a Class I turned around.

   4. Indirect Retention as a Reline Indicator
      a) Need for Reline – Pressure on saddle lifts indirect rest.
      b) Confirms Reline Seating – No biting during impression
      c) Adjust occlusion at delivery.

D. Clasp Design
   1. Supraborule Clasps – above height of contour
      a) Akers Clasp – Basic use (free-ends?)
      b) Wrought Wire Clasp – For wrong Side of Fulcrum
      c) Equipoise Clasp – Terminal tooth is an incisor
      d) Ring Clasp – Tipped Mandibular Second Molar
2. Infrabulge Clasps
   a) I-Bar Clasp – Contraindications: molars, buccal vestibule undercuts, lingual tipping and high frenums
   b) T-Bar Clasp – Modification (not any more)
3. Free-End Saddle Clasp Design
   a) Major Options: Distal Akers vs. RPI
      (1) Suprabulge versus Infrabulge
          (a) Pushing versus Pulling Retention
      (2) Engage during load versus Disengage
      (3) “Esthetic” options
4. Clasp Conclusions:
   a) RPI – Free-End Saddles
   b) Equipoise – Terminal Incisors
   c) Akers – Always Points Backwards
   d) Wrought Wire – Wrong Side of Fulcrum Line
5. Attachments – Ensure they are necessary
   a) Only replace clasps – Keep Guide Planes/Rest Seats
   b) Intracoronal Attachments – Tooth Borne RPDs only
      (1) Stern G/L, Number 7, etc.
      (2) Virtually all Intracoronal Attachments are Non-Resilient – and we want them to be so that we gain support from fixed abutments.
   c) Extracoronal Attachments – Preferred method for C&B
      (1) All Extra-coronal Attachments also connect to Implants
      (2) Must Double Abut. – Creates cantilever
          (a) Law of Beams: Stress/Strain = (K)\(^3\)
      (3) Bredent Attachments – Smallest on the market
          (a) Non-resilient
      (4) ERA – My favorite
          (a) Resilient
          (b) Has non-resilient Processing Component
          (c) Black Male Can be used for relines
VI. Removable Partial Prosthodontics Impression Techniques
   A. Canned alginate – Will you weight measure the powder?
   B. Custom Tray Fabrication/Selection – Reinventing the wheel?
   C. Impression Materials
      1. Irreversible Hydrocolloid (Alginate) – Mucostatic
         a) Canned Alginate – canned.
         b) “System 2” Syringable Alginate – Simple, inexpensive, quick to retake when necessary.
1. System 2 with ERA attachment impression procedure is outlined later in this handout.

2. Rubber Base – For use with custom trays.

3. Polyvinyl siloxane – not ideal, but best if you don't pour
   a) Follow Massad/Dentsply Aquasil impression tech.

4. Polyether – Ridgidity is best for Square imp. copings.

D. Free End Saddle Registration

1. Altered Cast Technique – Lacks Confidence – reline is required when it fails => Cut out the middle man and...

2. Reline at Delivery with PVS, Polyether, or Rubber Base
   a) Hydrocast (outlined below) is preferred technique
   b) Massad Aquasil PVS Technique – Dentsply DVD
      (1) 30 to 60 seconds of border molding
   c) Tissue Stop with Heavy Body (fast set)
   d) Border Mold with Monophase (regular set)
      (1) Need ideal borders to proceed - expect to repeat
   e) Final Wash with Light Body (regular set)

A. Hydrocast Reline Technique - This gives 24 hrs of border molding

1. Fabricate RPD in standard fashion from System 2 Alginate impression with one modification – Add three times normal relief for retention webbing in the saddles for the frame.

2. For Processing, ask your lab to process the lingual flange past the myohyoid ridge, but cut the facial flanges short (Use Myostatic Outline Technique). Have them relieve the saddle area acrylic after processing.

3. Mix Microseal and bench set for one minute. Load saddles and seat in the mouth for 7 minutes holding the framework in place – do not let the patient bite, nor apply pressure to the saddle areas. Trim Microseal to be 2 mm short of the flange. This is the “tissue stop” to support vertical.

4. Check and adjust the centric and eccentric occlusion – do it now, the RPD will be too sticky after the Hydrocast is used.

5. Mix Hydrocast and bench set for three to five minutes. Fill the denture with Hydrocast and seat it in the mouth.

6. Have the patient read aloud for ten minutes then remove

7. Trim excess Hydrocast with a hot spatula (#7 works great)

8. Reseat, patient wears for 24 hours – including meals and bedtime.
   (1) To clean: they only use fingers and running water.

9. At next day appointment pour stone to support the saddles & create a base overlapping onto the Hydrocast material. Send cast to the lab for a lab processed reline and then redeliver.

VII. Removable Partial Denture Framework Design
A. Framework Requirements
   1. Stability – Guide Planes, Major Connector and Flanges
   2. Support – Rest Seats (fulcrum), Major Connector, Saddles
   3. Retention – Clasp Arms or Attachments
B. Basic Kennedy Class II Framework – Page 14 in this Handout
   1. Kennedy Class I and III – Page 17 and 18 in this Handout
C. Frame Fit More Important than Design
D. Class IV Rotational Path RPD
   1. Engage Fists under Guide Planes
E. Class III Rotational Path RPD
   1. Prefer Mesial Rest to Distal Rest for Rotational Point
   2. Length of Guide Plane Dictates Undercut, not Rest Seat
      a) 3 mm Guide Plane: Standard 0.01” undercut
      b) Less than 3 mm Guide Plane: Use 0.02” undercut
   3. Rotational Path Only for Tooth Borne RPDs
F. Attachments necessary for Free-End Saddles
   1. Prefer to Double Abut and Use Resilient Attachments (not stress breakers, resilient). Attachment Options
   2. Attachments – ERA, Stern G/L and Dalbo attachments. SternGold-Implamed. 800-243-9942 ERA is Resilient
      a) This is my preferred attachment because it can be used with the Black ERA male for relines – especially the Hydrocast walking reline. When ERA is resilient, abutment stress is zero. However, double abut for future protection – reline needs increases stress.
   3. Attachments – VKS - SG vertical or horizontal Bredent Ball attachment. Bredent USA, Miami, FL; 800-328-3965.
      a) Use vertical attachment on the guide plane (VKS) it is non-resilient, but less than 2mm cantilever. For strong lower canines; lateral as double abutment is worthless.
      b) Horizontal version (trailer hitch) increases cantilever but can be used resiliently (still prefer ERA)
   4. Attachments – Ceka, Hader and Dolder Bars. Preat, 800-232-7732 (Ceka can be Resilient – so can SOME bars)
      a) Zaag can be resilient, Locator is not – it rotates.
   6. Attachments International 800-999-3003
VIII. Occlusal Design – Neurocentric and Balanced Not Covered
   A. Lingualized Occlusion – Very Easy to Deliver this Occlusion
   B. We should have confidence with fit, spend time on bite.
C. Lab should complete selective grind before breakout

D. Opposing Arch that is Natural Gets Adjusted
   1. Protects the Design Occlusal Pattern of Denture Teeth
   2. Lab Should Make Recipe of Adjustments to Follow Clinically
   3. Patient Should be Told of This at the Beginning of Treatment

E. Clinical Delivery is Three Steps: Adjust Centric Prematurities, Eliminate Buccal Interferences, Remove Hitches to Eccentrics.

F. Centric Occlusion
   1. Use Occlusal Indicator Wax to eliminate prematurities.
      a) Tap, tap, tap, squeeze with 80% pressure.
      b) Prosthesis - equal retention with and without wax
   2. If set up is lingualized occlusion, eliminate buccal contacts.

G. Eliminate Buccal Interferences
   1. Use Blue/Blue articulating paper (or any other)
      a) Mark side to side movement
      b) Obliterate all buccal interferences by adjusting the premolars in the lower arch and molars in the upper

H. Remove Hitches to Eccentrics – Observe, Ask, Mark, Adjust
   1. Observe the patient sliding side-to-side, watch for hitches
   2. Ask the patient if they feel the hitches – try to identify where
   3. Review denture for abnormally steep cusp that may be involved in creating this hitch then mark with paper
      a) Red to lower, slide side-to-side; Black to Lower, tap-tap-tap in centric, then adjust the steep cusp identified on the lower denture.
      b) Red to Upper, slide side-to-side; Black to Upper, tap-tap-tap in centric, then adjust the prominent palatal cusp on the upper denture.
      c) In lingualized occlusion, eliminate all buccal contacts.

IX. Prosthesis Delivery – Not covered in Lecture – Only on Handout

A. Ensure Frame Seats – acrylic may impede seating
   1. Occlude Spray works best for this just like Frame Trial Visit

B. Ensure Saddle is Well Adapted – Must be completed before occlusal
   1. Pressure Indication Paste
      a) Dab Vertically to make marks with brush
      b) Seat with Pressure on Frame First – adjust
      c) Seat with Pressure on Saddles Second – Adjust
      d) Eliminate Undercuts on Lingual of Lower PRN
      e) Prefer to See Pressure on Buccal Shelf rather than Ridge

C. Adjust Occlusion as needed and described above

X. Post Delivery Adjustments – Not Covered in Lecture – Only on Handout
A. Most Sores are Occlusal Related: Always adjust occlusion first
   1. Pressure Indicating Paste – Vertically dab, apply PIP to entire intaglio surface, seat and have patient chew on cotton rolls as you move them
   2. Crestal Marks – Adjust centric prematurities with wax
   3. Non-crestal Ridge Marks – Adjust eccentrics with paper
   4. Flange Extensions – Adjust pink acrylic and pumice.

XI. RPD Case Completion - Start to Finish (short outline)
   A. Initial Models – Diagnosis and Offers Patient Treatment
   B. Prep and Impress – Guide Planes, Rest Preps, Impression
   C. Frame Trial – Use Disclosing, Centric Bite with Separate Baseplate
   D. Wax Trial – Confirm Esthetics and Bite – lab processes case
   E. Reline at Delivery – PVS, Rubber Base or Microseal & Hydrocast
   F. Delivery – Confirm Centric and Balance
   G. One Week – Confirm Centric and Balance

XII. Fee should be more than Three Unit Bridge
   A. Three Unit Bridge Fee is a Strong Fee in Our Offices
      1. Replaces One Tooth
         a) Chairtime and Lab bill are Similar or Less for FxPP
   B. RPD replaces Many Teeth, Similar Lab Fee, More Chairtime
      1. Minimal Fee of 2 Units C&B
      2. Ideal Fee of 4 Units C&B
   C. Reline is one-third Cost of RPD
   D. Rebase with new teeth is two-thirds cost of RPD

XIII. RPD Attachment or Implant Assisted Case Completion Follows on Next Pages
Combination Case – Start to Finish Detailed Steps

I. Attachments may be added to an RPD via Crown and Bridge or with Implants, but the basic RPD framework should remain the same.
   A. Keep guide planes, rest seats and Major Connectors all the same
   B. If an attachment RPD, eliminate the clasps and add the attachments
   C. If an implant assisted RPD, keep the clasps and add the attachments

II. RPD Requirements: Retention, Stability, Support, Esthetics, Phonetics, Occlusion
   A. Retention – Clasp Arms and Attachments
   B. Stability – Guide Planes and Major Connector
   C. Support – Rest Seats, Some Major Connectors and Denture Base
   D. Esthetics, Phonetics and Occlusion from Teeth

A. First Visit: Initial Models – Diagnosis
   1. Basic Study Casts – Staff can make these, but consider making them yourself as a “Trial Run” for the final impression.
   2. Design Free End Saddle framework or Rotational Path frame
      a) Free End Saddle Frame for Kennedy Class I, II, III (free-end with extra tooth) and Class IV (free-end saddle turned around)
      b) Nearly All Labs Can Assist, But Call and Discuss

B. Second Visit and more: Caries Control, Endo & Perio PRN, C&B
   1. First Complete all caries control, endo, perio and other treatment
   2. If C&B is involved, do the following steps, though they will be repeated later, this is what makes combination cases successful.
      a) Visit 3+: System 2 impression of arch receiving combination
         (1) Fabricate baseplates and wax rims
      b) Visit 4+: Wax records, CR bite, tooth selection – lab sets teeth
      c) Visit 5+: Wax trial – Then Process and Duplicate interim RPD
         (1) Deliver interim partial denture PRN
         (2) Make an impression on the model using the baseplate as the “impression tray.” Use light body Rubber Base for this with a small amount of vasaline on the model.
   3. Visit 6: Prep Crown and Bridge
      a) Seat Wax trial and confirm prep clearances
      b) Make final impression for crown and bridge with wax trial PROPERLY seated
         (1) Use a stock impression tray. Cut a large hole in the middle of the palate. When making the final impression of the preps, have the wax trial (with rubber base model impression) already seated. Inject light body PVS impression material for your preps and
partially seat the loaded stock impression tray. Before fully seating
the impression tray, press one finger through the hole you’ve made
in the palate and ensure the wax trial is properly seated – then fully
seat tray.

4. Laboratory Fabricates Crown and Bridge
   a) Use wax trial on Master Die model to ensure C&B are planned,
      waxed, cast and fabricated to meet denture teeth
   b) Use a Milled Anterior Strap when Indicated
   c) Double Abut for Cantilevered Attachments
   d) Consider Ney MS attachment in #8/9 area to separate right and left
      sides, create an appearance of separate crowns, and simplify preparation
      (1) Standard Use – Female Supports
      (2) Inverted – Male Supports
      (3) Have lab make die model before removing the wax up and a solid
          model after removing the wax up
      (4) Fabricate C&B with an intimate understanding of where the denture
          teeth are supposed to be

C. Visit 7: Deliver Crown and Bridge – Impress for RPD Framework
   2. Prep Guide Planes on any other teeth in the arch First
   3. Prep Rest Seats on any other teeth in the arch second
   4. Impression Options for RPD Framework
      a) Pick Up Impression of C&B
         (1) Have had problems with poor impressions in the palate –
             something that never happens with System 2.
      b) Cement C&B – Make Standard RPD frame Impression
         (1) First Iteration I made an Impression of C&B without any
             impression copings or attachments in place
             (a) Had problems with Lab guessing where the black male
                 was going to be for the pick up
         (2) Second Iteration I used ERA’s impression copings
             (a) Had problems with frames that had a lot of adjustment
                 then overseated the attachment
         (3) Best Technique – Cement C&B and seat ERA Black males –
             then complete RPD Frame Impression
             (a) Now lab knows exactly the shape of our pick up will be and
                 they build up a flange around the male
             (b) Now we can complete the pick up after the frame is adjusted
                 – and before the case is processed.
             (c) Order a separate wax rim for records
      c) System 2 Alginate Technique with ERA Attachments
(1) My preferred technique for implants & attachments
(2) Measure water for System 2 syringe gel and tray gel
(3) Clean and clear intra-oral female component on attachments
(4) Seat ERA BLACK MALE (with metal housing) on any and all implants & attachments ensure the attachment’s completely seated
(5) Make and Remove the System 2 Imp as Noted Below
(6) Remove ERA BLACK MALE, save, but don’t place in imp
(7) Pour the impression immediately – vacuum mix stone.
(8) Send to the lab to fabricate RPD framework. The lab will cast the frame with “Thickened” latticework around the stone where the ERA Black Males were positioned. During the Frame Trial, you’ll need to seat the Black Males again, and pick them up with Acrylic before making any centric relation records. More to follow.

d) System 2 Alginate Impression: Contact Ivoclar for video
(1) Measure water for System 2 syringe gel and tray gel
(2) Mix water & powder for syringe gel, back load syringe with all the mixed alginate, place intra-oral tip on syringe.
(3) Mix water and powder for tray gel, load tray – ensuring to use enough pressure to extrude some alginate through the retentive holes on the tray. While you are using the syringe gel intra-orally, have your staff soak the tray gel under cool water.
(4) Wipe the mouth with 2X2 gauze.
(5) Use the syringe filled with syringe gel and beginning behind the most distal tooth and express the alginate out if the syringe while you follow the arch form along the occlusal surface to the midline – switch to the other side and repeat. Don’t go back-and-forth.
(6) Remove the intra-oral tip and syringe material into the vestibule on the right and left side.
(7) If this is an upper impression, syringe a dollop on the palate, for a lower, syringe into each lingual vestibule.
(8) Receive the tray from your auxiliary and seat – only far enough to merge the syringe gel with the tray gel. Border mold gently – alginate is easy to over border mold.
(9) Set your timer and stabilize the impression.
(10) After 3 minutes in the mouth, remove by loosening the alginate in the posterior vestibule – not by the handle. Soak and treat as you would standard alginate material.
(11) Pour the impression immediately – vacuum mix stone.
(12) Send to the lab to fabricate RPD framework.
D. Visit 8: Frame Trial – Most Important Step
1. Use Occlude Spray
   a) Clear rest seats and any attachments of food debris
   b) Dry frame, spray with Occlude, dry teeth, seat, rock across fulcrum line
      (1) Remove and check for shiny areas on the frame where the partial
denture binds. Adjust rest seats and indirect retainers more than
guide planes to achieve full seating of rest seats into the teeth.
   c) Pick up attachments today if you did that impression technique
      (1) Seat the Black Males again, and pick them up with GC Pattern
          Resin before making any centric relation records.
2. Complete wax records – a GREAT trick is to ask the lab to fabricate a
   separate baseplate and wax rim from the same model that the framework was
   made. That will allow you to check the framework for proper fit without
   baseplates attached to it AND we can do the Record visit the same day as
   the frame trial AND we can use an intra-oral tracing device if this is the
   upper by having an acrylic palate.
   a) Trim wax to be just below the proper occlusal plane
   b) Carve notches into bite rim on all edentulous areas
   c) Make CR record – Intra-oral tracing devices are ideal
3. Complete tooth selection

E. Visit 9: Wax Trial – Confirm Esthetics and Bite
1. Last chance to make changes without a fee

F. Visit 10: Free-End Saddle Registration – Done 100% of the time – always better
to reline than to evaluate if you need a reline.
1. Reline at Delivery – If ERAs were used, then Black Males in place now.
   a) PVS, Polyether, or Rubber Base gives you 30 seconds of border molding
      versus 24 hours with Hydrocast technique

G. Visit 11: Delivery – If ERAs were used, seat White Males in RPD
1. Centric Occlusion
   a) Use Occlusal Indicator Wax to eliminate prematurities.
2. Eccentric Occlusion – Use horseshoe paper for group function
   a) With Blue/Blue Horseshoe Paper – Slide side-to-side and Obliterate Upper
      Molar Buccal Contacts and Lower Premolar Buccal Contacts

H. Last Visit: One Week Post Delivery Adjustment – Confirm Centric and Balance
   and Check for Sore Spots - most are occlusally created
1. Use PIP to locate sore spots, but adjust occlusion, not intaglio
   a) Crestal Marks – Adjust centric prematurities with wax
   b) Non-crestal Ridge Marks – Adjust eccentricities with paper
2. One post op is all that is scheduled unless major changes were made
XIV. Combination Case – Start to Finish Detailed Steps

E. First Visit: Initial Models – Diagnosis

1. Basic Study Casts – Staff can make these, but consider making them yourself as a “Trial Run” for the final impression.

2. Design Free End Saddle framework or Rotational Path frame
   a) Free End Saddle Frame for Kennedy Class I, II, III (free-end with extra tooth) and Class IV (free-end saddle turned around)
   b) Nearly All Labs Can Assist, But Call and Discuss

F. Second Visit and more: Caries Control, Endo & Perio PRN, C&B

1. First Complete all caries control, endo, perio and other treatment

2. If C&B is involved, do the following steps, though they will be repeated later, this is what makes combination cases successful.
   a) Visit 3+: System 2 impression of arch receiving combination
      (1) Fabricate baseplates and wax rims
   b) Visit 4+: Wax records, CR bite, tooth selection – lab sets teeth
   c) Visit 5+: Wax trial – Then Process and Duplicate interim RPD
      (1) Deliver interim partial denture PRN
      (2) Impress the model using the baseplate as the “impression tray.” Use light body Rubber Base for this with a small amount of vaseline on the model.

3. Visit 6: Prep Crown and Bridge
   a) Seat Wax trial and confirm prep clearances
   b) Make final impression for crown and bridge with wax trial PROPERLY seated
      (1) Use a stock impression tray. Cut a large hole in the middle of the palate. When making the final impression of the preps, have the wax trial (with rubber base model impression) already seated. Inject light body PVS impression material for your preps and partially seat the loaded stock impression tray. Before fully seating the impression tray, press one finger through the hole you’ve made in the palate and ensure the wax trial is properly seated – then fully seat tray.

4. Laboratory Fabricates Crown and Bridge
   a) Use wax trial on Master Die model to ensure C&B are planned, waxed, cast and fabricated to meet denture teeth
   b) Use a Milled Anterior Strap when Indicated
   c) Double Abut for Cantilevered Attachments
   d) Consider Ney MS attachment in #8//9 area to separate right and left sides, create an appearance of separate crowns, and simplify preparation
      (1) Standard Use – Female Supports
(2) Inverted – Male Supports
(3) Have lab make die model before removing the wax up and a solid model after removing the wax up
(4) Fabricate C&B with an intimate understanding of where the denture teeth are supposed to be

D. Visit 7: Deliver Crown and Bridge – Impress for RPD Framework
4. Prep Guide Planes on any other teeth in the arch First
5. Prep Rest Seats on any other teeth in the arch second
6. Impression Options for RPD Framework
   a) Pick Up Impression of C&B
      (1) Have had problems with poor impressions in the palate – something that never happens with System 2.
   b) Cement C&B – Make Standard RPD frame Impression
      (1) First Iteration I made an Impression of C&B without any impression copings or attachments in place
         (a) Had problems with Lab guessing where the black male was going to be for the pick up
      (2) Second Iteration I used ERA’s impression copings
         (a) Had problems with frames that had a lot of adjustment then overseated the attachment
      (3) Best Technique – Cement C&B and seat ERA Black males – then complete RPD Frame Impression
         (a) Now lab knows exactly the shape of our pick up will be and they build up a flange around the male
         (b) Now we can complete the pick up after the frame is adjusted – and before the case is processed.
         (c) Order a separate wax rim for records
   c) System 2 Alginate Technique with ERA Attachments
      (1) My preferred technique for implants & attachments
      (2) Measure water for System 2 syringe gel and tray gel
      (3) Clean and clear intra-oral female component
      (4) Seat ERA BLACK MALE (with or without metal housing – I prefer to skip the metal housings for RPDs since they are loose) ensure the attachment’s completely seated
      (5) Make and Remove the System 2 Imp as Noted Above
      (6) Remove ERA BLACK MALE, save, but don’t place in imp
      (7) Pour the impression immediately – vacuum mix stone.
      (8) Send to the lab to fabricate RPD framework. The lab will cast the frame with “Thickened” latticework around the stone where the ERA Black Males were positioned. During the Frame Trial, you’ll
need to seat the Black Males again, and pick them up with GC Pattern Resin before making any centric relation records. Read on for recommendations.

d) Visit 7 Alternative Technique - System 2 Alginate Impression:
Contact Ivoclar for video
(1) Measure water for System 2 syringe gel and tray gel
(2) Mix water & powder for syringe gel, back load syringe with all the mixed alginate, place intra-oral tip on syringe.
(3) Mix water and powder for tray gel, load tray – ensuring to use enough pressure to extrude some alginate through the retentive holes on the tray. While using the syringe gel, have your staff soak the tray gel under cool water.
(4) Wipe the mouth with 2X2 gauze.
(5) Use the syringe filled with syringe gel and beginning behind the most distal tooth and express the alginate out if the syringe while you follow the arch form along the occlusal surface to the midline – switch to the other side and repeat. Don’t go back-and-forth.
(6) Remove the intra-oral tip and syringe material into the vestibule on the right and left side.
(7) If this is an upper impression, syringe a dollop on the palate, for a lower, syringe into each lingual vestibule.
(8) Receive the tray from your auxiliary and seat – only far enough to merge the syringe gel with the tray gel. Border mold gently – alginate is easy to over border mold.
(9) Set your timer and stabilize the impression.
(10) After 3 minutes in the mouth, remove by loosening the alginate in the posterior vestibule – not by the handle. Soak and treat as you would standard alginate material.
(11) Pour the impression immediately – vacuum mix stone.
(12) Send to the lab to fabricate RPD framework

e) Visit 7 Alternative Technique: System 2 Alginate with ERA Impression Copings – The ERA way of doing it
(1) Measure water for System 2 syringe gel and tray gel
(2) Clean and clear intra-oral female component
(3) Seat ERA impression coping, ensuring the attachment is completely seated
(4) Make and Remove System 2 Imp as Detailed Above
(5) Remove the ERA impression coping.
(6) Seat an ERA replica fully onto the ERA impression coping and snap these replicas back into the impression – confirm seating.
(7) Pour the impression immediately – vacuum mix stone.
(8) Send to the lab to fabricate RPD framework

I. Visit 8: Frame Trial – Most Important Step
   1. Use Occlude Spray
      a) Clear rest seats and any attachments of food debris
      b) Dry frame, spray with Occlude, dry teeth, seat, rock across fulcrum line
         (1) Remove and check for shiny areas on the frame where the partial
denture binds. Adjust rest seats and indirect retainers more than
guide planes to achieve full seating of rest seats into the teeth.
      c) Pick up attachments today if you did that impression technique
         (1) Seat the Black Males again, and pick them up with GC Pattern
             Resin before making any centric relation records.
   2. Complete wax records – a GREAT trick is to ask the lab to fabricate a
      separate baseplate and wax rim from the same model that the framework was
      made. That will allow you to check the framework for proper fit without
      baseplates attached to it AND we can do the Record visit the same day as
      the frame trial AND we can use an intra-oral tracing device if this is the
      upper by having an acrylic palate.
      a) Trim wax to be just below the proper occlusal plane
      b) Carve notches into bite rim on all edentulous areas
      c) Make CR record – Intra-oral tracing devices are ideal
   3. Complete tooth selection

J. Visit 9: Wax Trial – Confirm Esthetics and Bite
   1. Last chance to make changes without a fee

K. Visit 10: Free-End Saddle Registration – Done 100% of the time – always better
to reline than to evaluate if you need a reline.
   1. Reline at Delivery – If ERAs were used, then Black Males in place now.
      a) PVS, Polyether, or Rubber Base gives you 30 seconds of border molding
         versus 24 hours with Hydrocast technique

L. Visit 11: Delivery – If ERAs were used, seat White Males in RPD
   1. Centric Occlusion
      a) Use Occlusal Indicator Wax to eliminate prematurities.
   2. Eccentric Occlusion – Use horseshoe paper for group function
      a) With Blue/Blue Horseshoe Paper – Slide side-to-side and Obliterate Upper
         Molar Buccal Contacts and Lower Premolar Buccal Contacts

M. Last Visit: One Week Post Delivery Adjustment – Confirm Centric and Balance
   and Check for Sore Spots - most are occlusally created
   1. Use PIP to locate sore spots, but adjust occlusion, not intaglio
      a) Crestal Marks – Adjust centric prematurities with wax
      b) Non-crestal Ridge Marks – Adjust eccentrics with paper
   2. One post op is all that is scheduled unless major changes were made
# Partial Denture Lab Prescription

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![Denture Diagram]

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Signature:  
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Page 13
Framework Design

Kennedy Class II
- Lingual Bar
- Distal GP #20
- Mesial Rests #20, 31
- I-Bar #20, Akers #31
- Mesial Rest #28
- Three Times Relief & Distal Tissue Stop

Kennedy Class I
- Lingual Bar
- Distal GPs #20, 29
- Mesial Rests #20, 29
- I-Bar #20, 29
- Mesial Rests #21, 28
- Three Times Relief & Distal Tissue Stop

RPI Clasp Design
- Akers Clasp Design

Kennedy Class II
- Modifications
  - Additional Space
  - Non-Free End
  - Rest Each Side
  - Long Guide Planes
  - No Clasp Arms

Kennedy Class I
- Lingual Plate
- Distal GPs #22, 27
- Cingulum Rests #22, 27
- I-Bar #22, 27
- Lingual Plate
- Three Times Relief & Distal Tissue Stop

Kennedy Class III
- Lingual Bar
- Mesial GP #19; Distal GP #21
- Mesial Rests #19, 31, 21
- Akers #19, 31; I-Bar #21
- Mesial Rest #28
- Standard Design
Framework Design Atlas

**Framework Design**

**Kennedy Class IV**
- Horseshoe
- Mesial GPs #6 & 11
- Cingulum Rests #6 & 11
- Mesial Rests #2 & 15
- Akers #2 & 15
- I-Bars #6 & 11
- Mesial #2 and 15

**Framework Design**

**Rotational Path**
- Mesial GPs #6 & 11
- Cingulum Rests #6 & 11
- Mesial Rests #2 & 15
- Clasps Akers #2 & 15
- Fists: Mesial #6 & 11
- Mesial Rests #2 and 15

**Framework Design**

**Rotational Path**
- Lingual Bar
- Guide Planes on Proximals
- Rest Seats Bracket Pontics
- Akers Reaching Back
- Fist Retention Under GPs

**Framework Design**

**Kennedy Class I**
- Distal GPs #6 & 11
- Cingulum Rests #6 & 11
- I-Bars #6 & 11
- Implants #2 and 15
- Rotational Attachments

**Framework Design**

**Kennedy Class I**
- C&B 6-11
- A-P Strap
- Distal #6 Through 11
- Cingulum #6 Through 11
- Attachments Distal #6 & 11
- Milled Anterior Strap
Reference List

Textbooks: (Sorry, I’ve yet to review an acceptable Attachment Textbook.)

Journal Articles:
Product List

Blue Dolphin Products – Papilla Meter, Wax Spatulas, Bunsen Burner. 800-448-8855

Brassler – NSK Lab Handpiece, Acrylic Adjustment Burs, Ultra Denture Polishers. 800-841-4522

Dentsply – Fox plane, Aquasil Impression Material, Aquasil Impression Trays, Portrait, Trublend & Porcelain Denture Teeth, Alma Gauge, Trubyte Tooth Indicator, Vitallium Clasp Adjuster (N001960) Dentsply Prosthetic 800-786-0085


Ivoclar – Blue Line, Postaris and Phonares Denture Teeth, System 1 and System 2 Impression Material and Impression Trays, Stratus 2000 Articulator, Smile Design Kit. 800-533-6825

Kerr – Permalastic Rubber Base Impression Material, Pink Baseplate Wax, Occlusal Indicator Wax, Green Stick Compound. 800-537-7123

Bosworth Dental – New Truliner (chairside reline material). 708-679-3400

GC America – Unifast TRAD (repair acrylic). 800-323-7063

Lee Mark Dental – Coble Balancer, Massad Balancer, Lessman Wax Knife, Wax Spatulas, Electric Waxer, Water Bath for Compound. 866-533-6275

Miscellaneous Products:
2. Attachments - VKS vertical or horizontal attachment. Bredent; 800-328-3965.
3. Attachments - ERA attachment & EZ Pick Up with Light Cure Varnish to pick up attachments. SternGold. 800-243-9942
4. Attachments - Preci Clix attachment. Preat 800-232-7732
5. Attachments - Locator attachment. Zest Anchors 800-262-2310