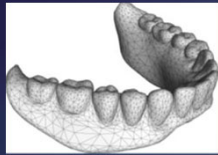
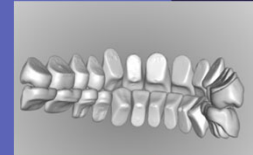


Digital Complete Dentures... Not Your Grandma's Denture Anymore! ©2024



D **J** **Q** **Journées**
Dentaires
Internationales
Québec



Ronni A. Schnell, DMD, MAGD, FICD, FACD

Boston University Henry M Goldman School of Dental Medicine

May 27, 2024

rschnell@bu.edu

Table of Contents:

| | | |
|---|-------|-------|
| ▶ Complete Denture Workflow | Pages | 2-3 |
| ▶ Clinical Techniques | | 4-5 |
| ▶ Clinical Records Required | | 4-5 |
| ▶ Set-up & Appt Tasks | | 6-9 |
| ▶ Checklist for send out a case | | 10 |
| ▶ Req'd Photos – Wax rim technique | | 11-12 |
| ▶ Req'd Photos – Reference Denture | | 12-13 |
| ▶ Req'd Photos – Interim/Immediate Denture | | 13 |
| ▶ Lab Rx template – for BTI | | 14 |
| ▶ Lab Rx template – for final milled dentures | | 15 |
| ▶ Digital Preview Evaluation | | 16-30 |
| ▶ BTI Try-in | | 31-35 |
| ▶ Denture Shade Tabs | | 36-37 |

Many Techniques for Clinical Records

Intra-oral scans



Various Devices



Duplicate Denture



Reference Denture



Wax Rim Technique

Wagner Try-in



Required Clinical Records Regardless of Technique

- ▶ Intaglio
- ▶ VDO & CR
- ▶ CR
- ▶ Midline and horizontal plane
- ▶ Lip Support
- ▶ Tooth mould, shade, denture base shade
- ▶ PPS (if maxillary)
- ▶ Photos

* Analog or Digital Occlusion Rim or Reference Denture

Workflow – Analog v Digital

Impressions



Records



Set-up



Try-in



Processing & Insertion

Conventional:
Pack & Press
Injection
Pour

Digital:
Monolithic milled
Milled & bonded
Milled & milled
Milled & printed
Printed & bonded
Printed & printed
Others...



Impressions

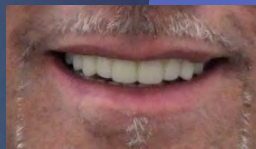


Records

Set-up



Try-in



Processing & Insertion

Digital:
Monolithic milled
Milled & bonded
Milled & milled
Milled & printed
Printed & bonded
Printed & printed
Others...

Current denture
Requiring minimal changes in:

- VDO / Occlusion
- Esthetics,
- Tooth position

Scanned
after
impressions
& bite

Digital Denture Final Impression Procedure

INSTRUMENTS AND SUPPLIES

- Removable Pros Cassette
- High volume suction
- Heavy PVS and tips
- LV & XLV PVS and tips
- PVS Adhesive & brush
- 2 Impression Guns
- Mixing blade and fine scissors
- Camera

PRE-OPERATIVE TASKS

- “Have there been any changes to your health or medicines”? Take BP.
- Are opposing impressions needed for this patient: _____
- Have ready: Custom tray(s) with double blockout or Massad tray(s)
- or
- **Patient preferences:** Does the patient want a set up similar to their denture? What changes do they want? If denture is to be copied, do duplicate denture technique

APPOINTMENT TASKS - **AFTER** Final impressions are made

- Posterior Palatal Seal procedure
 - Draw on palate with indelible pencil (Thompson stick) – TAKE PHOTO
 - Record 5 compressible depths across AVL on paper
 - Transfer to cast and score when available
- Progress note will have questions for Digital Denture
- Be sure you check off you are doing a digital denture
- Pour cast and score PPS
- Fabricate Record Bases and Occlusion Rims

Digital Denture Intermaxillary Records Procedure

INSTRUMENTS AND SUPPLIES

- Removable Pros Cassette
- Long piece of floss
- Bite registration material and tips
- 1 Impression Gun
- 2 Tongue blades
- Hot water bath
- Wax spatula & Flat plane
- Marker
- Camera
- Thompson stick

PRE-appointment TASKS

- “Have there been any changes to your health or medicines”? Take BP.
- Have ready: Records bases and Occlusion Rims

APPOINTMENT TASKS - **AFTER** WAX RIMS are FULLY ADJUSTED

- Take PHOTOS: full face photo; profile; up close smile photos (all photos should show closed mouth, repose/slightly open, smile, and BIG smile) with current denture and with adjusted occlusion rims. A retracted edentulous/**ridges parallel & retracted occlusion** rims (with midline, canine lines and high smile lines) should also be taken
- Shape the wax rims to develop correct:
 - Vertical dimension
 - Incisal edge position
 - Lip support
 - Horizontal plane
 - Posterior Palatal Seal procedure
 - Draw on palate with indelible pencil (Thompson stick) – TAKE PHOTO
 - Record 5 compressible depths across AVL on back of cast
 - Transfer to cast and score ½ depths when available
- Mark the wax rims:
 - Midline
 - Canine lines
 - High smile line
- **Shade:** Avadent XCL1 Shade guide _____ or Dentsply Portrait _____ **See page 8**
- **Moulds:** Dentsply Portrait: _____ **See page 8**
- **Denture base shade:** circle one Fibered light, Fibered Dark (similar to 50:50), Extra Dark (similar to Lucitone Dark), Lucitone 199 Original Shade and Clear
- **Patient preferences:** Does the patient want a set up similar to their denture? What changes do they want? If denture is to be copied, do duplicate denture technique

• Class I, II, III, unilateral / bilateral cross-bite (estimate): _____

• Occlusal scheme: (circle one) LINGUALIZED MONOPLANE Flat/Curve BIOCOPY OPPOSING

Digital Denture Impression & Records Procedure

Reference Denture Technique

INSTRUMENTS AND SUPPLIES

- Removable Pros Cassette
- High volume suction
- Long piece of floss
- Heavy Material (PVS) and tips
- Extra-Light Wash Material (XLV - PVS) & tips
- Adhesive & Brush
- Bite registration material and tips
- 3 Impression Guns
- Lab blade and fine scissors
- 2 Tongue blades
- Slow speed handpiece, straight nose att
- Marker
- Camera

PRE-appointment TASKS

- “Have there been any changes to your health or medicines”? Take BP.
- Are opposing impressions are needed for thispatient: _____
- Have ready the duplicated dentures

APPOINTMENT TASKS - **AFTER** IMPRESSION MATERIAL HAS BEEN ADDED TO DUPLICATE DENTURE

- PHOTOS: Take full face photo; profile; up close smile photos (all photos should show closed mouth, repose/slightly open, smile, and BIG smile) with current denture and with duplicated dentures if changes have been made. A retracted edentulous/ridges parallel & retracted occlusion rims (with midline, canine lines and high smile lines) should also be taken
- **Posterior Palatal Seal procedure**
 - Draw on palate with indelible pencil (Thompson stick) – TAKE PHOTO
 - Transfer to impression and add wax according to the 5 compressible depths
- Vertical dimension changes: _____ **Check Sibilants** (How much does the vertical need to be changed from new bite record if needed? Specify + or -) - 3mm is limit
- Lip support - _____ (are the teeth set too facial or lingual?, check by looking at upper teeth on wet dry line of lower lip, check SH sound for lower teeth)
- Incisal edge position- _____ check **Fricatives, High Smile Line** (are the teeth too high or low?),
- **Horizontal Plane?** Teeth on L or R need to go UP or DOWN by how many mm? _____
- **Midline** circle UPPER or LOWER needs to go L or R how many mm? _____
- **Shade:** Avadent XCL1 Shade guide _____ or Dentsply Portrait _____ **See page 8**
- **Moulds:** Dentsply Portrait: _____ **See page 8**
- **Denture base shade:** circle one Fibered light, Fibered Dark (similar to 50:50), Extra Dark (similar to Lucitone Dark), Lucitone 199 Original Shade and Clear
- **Patient preferences:** What changes do they want from their current dentures, if any? _____
- Class I, II, III, unilateral / bilateral cross-bite (estimate): _____
- Occlusal scheme: (circle one) LINGUALIZED MONOPLANE Flat/Curve BIOCOPY OPPOSING

Immediate Denture Impression Procedure

INSTRUMENTS AND SUPPLIES

- Removable Pros cassette
- High speed suction and tips
- Heavy body PVS & tips
- LV & XLV PVS and tips
- PVS Adhesive & brush
- Bite registration material and tips
- 3 Impression Guns
- Impression trays
- Periphery wax
- Long piece of floss
- Camera

PRE-appointment TASKS

- “Have there been any changes to your health or medicines”?
- Make opposing impression if this appointment is for a single arch, **with any existing partial or denture in place**
- PHOTOS: Take full face photo; profile; up close smile photos (all photos should show closed mouth, repose/slightly open, smile, and BIG smile) with current denture and with duplicated dentures if changes have been made. A retracted edentulous/ridges parallel & retracted occlusion rims (with midline, canine lines and high smile lines) should also be taken

APPOINTMENT TASKS

- Posterior Palatal Seal procedure
 - Draw on palate with indelible pencil (Thompson stick) – TAKE PHOTO
 - Transfer to impression and add wax according to the 5 compressible depths
- Vertical dimension changes: _____ **Check Sibilants** (How much does the vertical need to be changed from new bite record if needed? Specify + or -) - 3mm is limit
- Lip support - _____ (are the teeth set too facial or lingual?, check by looking at upper teeth on wet dry line of lower lip, check SH sound for lower teeth)
- Incisal edge position- _____ check **Fricatives, High Smile Line** (are the teeth too high or low?),
- **Horizontal plane?** Teeth on L or R need to go UP or DOWN by how many mm? _____
- **Midline** circle UPPER or LOWER needs to go L or R how many mm? _____
- **Shade:** Avadent XCL1 Shade guide _____ or Dentsply Portrait _____ See page 8
- **Moulds:** Dentsply Portrait: _____ See page 8
- **Denture base shade:** circle one Fibered light, Fibered Dark (similar to 50:50), Extra Dark (similar to Lucitone Dark), Lucitone 199 Original Shade and Clear
- **Patient preferences:** Does the patient want straight teeth? Do they want dentures to look as close as possible to their own teeth? Specific requests like diastema?

Circle one: PERFECT NATURAL BLEND JUST LIKE THEIR OWN TEETH

Occlusal scheme: (circle one) LINGUALIZED MONOPLANE Flat/Curve BIOCOPY OPPOSING

Clinical Photos:

- Occlusion Rim Technique
- Reference Denture Technique
- Immediate & Interim Dentures
- BTI Try-in

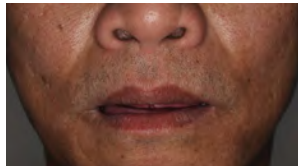
Current Denture



Repose

Smile

Occlusal Rims



Repose

Smile

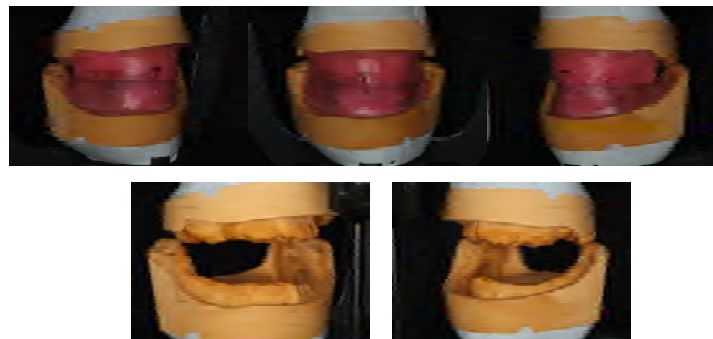
Retracted Occlusal Rims in CR



Retracted
Edentulous



And Mounting...



Posterior Palatal Seal



l...



Verify that post dam is prepped into final cast, so that it can be captured and incorporated when scanned

Reference Denture



Required Clinical Records

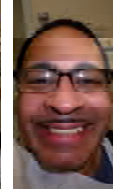
- ▶ Intaglio
- ▶ VDO & CR
- ▶ CR
- ▶ Midline and horizontal plane
- ▶ Lip Support
- ▶ Tooth mould, shade, denture base shade
- ▶ PPS (if maxillary)
- ▶ Photos



Natural dentition – After Stage 1 extractions for Interim Complete Upper Denture



Full face



Full face smile

**Interim Complete
and
Immediate Dentures**



Repose



Occlusion(s) rim @ VDO & CR



Post Dam + Score on Cast



Mounted and
Midline Indicated and Scored



Clinical photos: BTI Try-in

Take full face photo and close ups as follows:

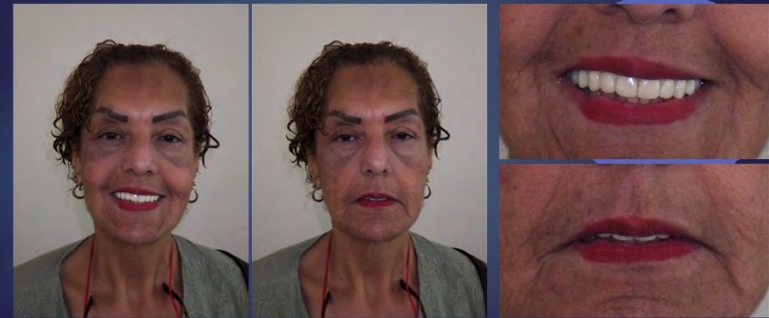
- ▶ all photos should show – Front and Profile images:
 - ▶ Repose
 - ▶ Smile
 - ▶ and BIG smile

After Occlusal Adjustment and in Bilateral Contact

- ▶ Retracted – 3 views
- ▶ Retracted Bite – 3 views

52

Full Face & Close Up... Smile + Repose



53

BTI in full contact after occlusal adjustment,
if needed, with & w/o Aluwax



54

Prescription Form *Initial records for BTI*



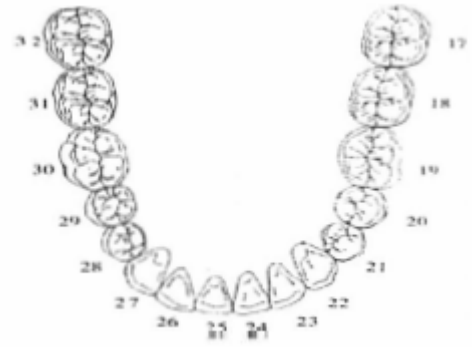
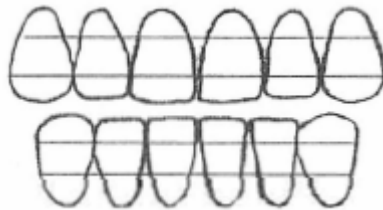
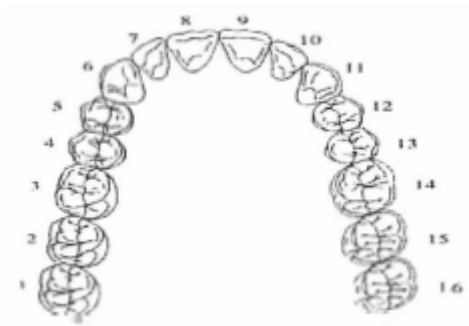
Student Name: XXX XXX Student BUID #: U#

Patient Name: XXX XXX Patient Chart #: XXXXXXX

Restoration: CU/CL Material: Monolithic Lab: AvaDent Sent: _____ Due: _____

Return as: BTI Shade: Tooth & Denture Base Shades

Custom Shade Design Diagram



Special Instructions: **Patient's DOB _____ (Needed when entering Rx thru online Dashboard)**

1. In house - Please scan U/L casts (or impressions) and Occlusion rims (records) for digital dentures
2. Avadent - Please set the following teeth for Digital Preview:

Dentsply Portrait Upper Anterior Mould _____ Shade _____

Dentsply Portrait Lower Anterior Mould _____

Posterior Occlusion:

____Lingualized

____ Monoplane: __Flat __Curved

____ Biocopy opposing dentition (for single arches)

Thank you,

Your name/signature/contact info

Faculty

Print Name: _____ **Your GSF** _____ Signature: _____ Date: _____

Finance Office

Print Name: _____ Signature: _____ Date: _____

Quality Control

Print Name: _____ **Dr. Schnell** _____ Signature: _____ Date: _____

Prescription Form *For changes or final denture*



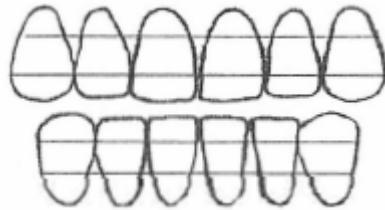
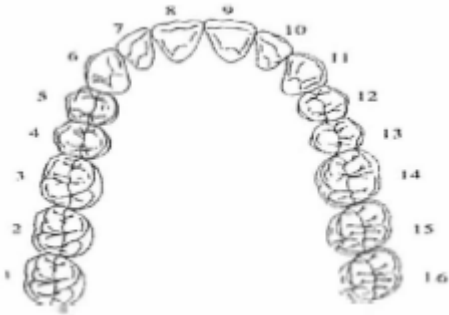
Student Name: XXX XXX Student BUID #: U#

Patient Name: XXX XXX Patient Chart #: XXXXXXX

Restoration: CU/CL Material: Monolithic Lab: AvaDent Sent: _____ Due: _____

Return as: Final denture(s) Shade: Tooth & Denture Base Shades

Custom Shade Design Diagram



Special Instructions:

1. **In house** - (only if new scans are needed)
 - a. Please scan U/L casts (or impressions) and Occlusion rims (records) for digital dentures
2. **Avadent** -
 - a. **If changes need to be made...** Please make the following changes...
 - b. **If no changes need to be made...** Good BTI try-in. Please complete the final milled monolithic denture(s).
 - i. Tooth shade _____
 - ii. Denture base shade _____
 - iii. Patient name in denture _____
 - iv. Rugae on palate? Y / N

Thank you,

Your name/signature/contact info

Faculty

Print Name: Your GSF Signature: _____ Date: _____

Finance Office

Print Name: _____ Signature: _____ Date: _____

Quality Control

Print Name: Dr. Schnell Signature: _____ Date: _____

Digital Preview Evaluation

CLICK ON AND OFF THE "REFERENCE" VISIBILITY

1. Check the pink bases first:
 - Correct extension and border thickness?
 - Poster palatal seal position?
 - Rugae present or not?
2. Verify set-up or changes requested from laboratory rx /appointment notes
3. Check teeth:
 - Midline – compare to opposing arch and to reference
 - Horizontal plane – evaluate for a cant
 - Evaluate tooth size and shape – do posterior teeth match anterior
4. Is the occlusal scheme appropriate?
 - Tooth Position:
 - No incisal contacts in anterior
 - Tight occlusal contacts in posterior
 - Mandible:
 - Are the mandibular incisors centers to the crest of ridge or out past the depth of the vestibule?
 - Posteriors centered or slightly lingual to the crest of ridge (line drawn from the mesial of the canine to the lingual of the RMP lines up with the lingual cusps)
 - Occlusal plane $\frac{1}{2}$ - $\frac{2}{3}$ RMP
 - Maxilla:
 - Facial surfaces of maxillary incisors ~6-8mm forward of the incisive papilla
 - Buccal cusps of posteriors 1.5-2mm "reveal" or offset to lower buccal cusps
 - Is balanced occlusion needed?
5. Do any teeth need to be excluded? Do diastemata need to be included?

CLICK ON THE VIEW PRESETS ATBOTTOM

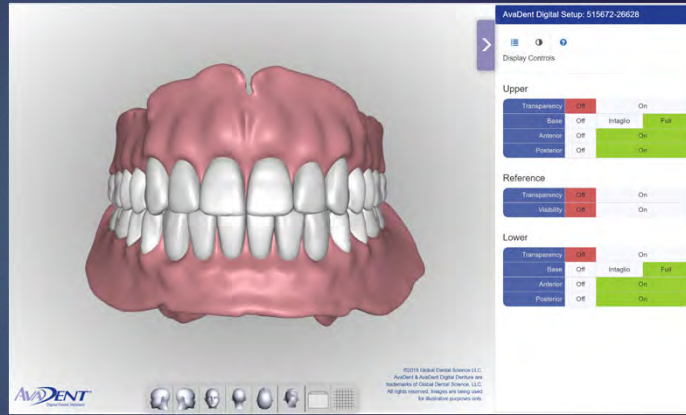
6. SUPERIOR VIEW of mandible only - Line from mesial of canine to the lingual of retromolar pad (lingual cusps should follow this line)
7. SAGITTAL VIEW of mandible only - Line from cusp tip of canine to $\frac{1}{2}$ retromolar pad (posterior mandibular teeth cusps should follow this line or sink slightly below it)
8. SUPERIOR VIEW of maxilla - Facial surface of maxillary incisors is about 6-8mm from the center of the incisive papilla
9. ANTERIOR VIEW of maxilla - Middle of the incisal edge of the central incisor to the mandibular residual ridge measures about 10-12 mm for restorative space for a mandibular overdenture
10. ANTERIOR VIEW of maxilla – Incisive papilla to mandibular residual ridge should measure about 12-15mm at minimum for restorative space for a complete upper and lower digital denture

11. ANTERIOR VIEW of maxilla – Lowest point of tuberosity to highest point of retromolar pad should measure about 2-3mm of clearance for restorative space for a complete upper and lower digital denture.

WAGNER TRY-IN (WTI):

12. ANTERIOR VIEW of maxilla only - Middle of the incisal edge of the central incisor to the edge of the vestibule measures about 22mm (only an average for WTI)
13. ANTERIOR VIEW of mandible only - Middle of the incisal edge of the central incisor to the edge of the vestibule measures about 18mm (only an average for WTI)

Digital Preview Evaluation Checklist



AHHelal A, Goodacre B, Kattadiyil M, Swamidass R. Errors associated with digital preview of computer engineered complete dentures and guidelines for reducing them: A technique article. J Prosthet Dent 2018;119(1):17-25.

Digital Preview Evaluation Checklist

1. Evaluate tooth arrangement in relation to ear axis. The tooth arrangement should follow the ear axis and be aligned with the anterior ridge by following vestibular-midline-midline principles. The lingual cusp of the mandibular teeth should ideally fall within the Prasad trough unless otherwise indicated. * AhHal et al.

2. Evaluate the distance from the most posterior point of the incisive papilla to the labial surface of the central incisors in relation to the provided records (10-12 mm). * AhHal et al.

3. Evaluate the antero-posterior and vertical overlap of the anterior teeth. Confirm the provided horizontal and vertical overlap based on conservative prosthodontic principles and confirm a shallow incisal guidance. * AhHal et al.

4. Evaluate tooth arrangement in relation to ear axis. The tooth arrangement should follow the ear axis and be aligned with the anterior ridge by following vestibular-midline-midline principles. The lingual cusp of the mandibular teeth should ideally fall within the Prasad trough unless otherwise indicated. * AhHal et al.

5. Evaluate the provided occlusal relationship class I, II, or III. Mandibular mandibular occlusal preparation has been reported to induce appropriate occlusal vertical dimension (OVD). * AhHal et al.

6. Evaluate the posterior aspect of the mandibular occlusal plane to correspond with the axial slope of the retentive part. * AhHal et al.

7. Evaluate the most posterior mandibular denture teeth position. Check sides to ensure they are not positioned on the ascending part of the ramus, on an inclined plane. * AhHal et al.

8. Evaluate the most posterior maxillary denture teeth position. Check sides to ensure they are not positioned on the ascending part of the ramus, on an inclined plane. * AhHal et al.

9. Ensure proper occlusion between maxillary and mandibular teeth. * AhHal et al.

10. Evaluate the relationship of the incisal edge of the provided teeth to ensure it coincides with the incisive marked on the record. Re-evaluate using 3 horizontal and vertical analysis and 3 perspective decrease planes. Evaluate the frontal virtual preview of the CECD for symmetry. * AhHal et al.

11. Evaluate required tooth type and morphology for required occlusal scheme, lingual-labial balanced occlusion or monoplane. * AhHal et al.

12. Evaluate the posterior maxillary denture base extension. Ensure extension to cover parafunctional features. Evaluate posterior palatal seal and dimension if required. * AhHal et al.

13. Evaluate posterior mandibular denture base extension. Ensure coverage of retentive pads and buccal shelf areas. * AhHal et al.

14. Evaluate the distance from the incisal edge of the anterior teeth to the occlusal surface of the denture base. Ensure sufficient available posterior space for the denture base and the anterior teeth teeth, which will be in the relation of CECD type (monoplane or balanced). In a residual posterior space consider the use of resilient CECDs, which allow and bases anterior compressive strength. * AhHal et al.

15. Evaluate the distance from the incisal edge of the anterior teeth to the occlusal surface of the denture base. Ensure sufficient available posterior space for the denture base and the anterior teeth teeth, which will be in the relation of CECD type (monoplane or balanced). In a residual posterior space consider the use of resilient CECDs, which allow and bases anterior compressive strength. * AhHal et al.

16. Evaluate the distance from the incisal edge of the anterior teeth to the occlusal surface of the denture base. Ensure sufficient available posterior space for the denture base and the anterior teeth teeth, which will be in the relation of CECD type (monoplane or balanced). In a residual posterior space consider the use of resilient CECDs, which allow and bases anterior compressive strength. * AhHal et al.

17. When in doubt, a trial placement procedure is recommended to provide an objective evaluation of the definitive prosthesis before its fabrication. * AhHal et al.

18. Evaluate proper fit and proper growth level indicated by study model compared with the provided records showing the highest location of the upper lip during smiling. All other cases, customized functional prosthodontics, and patient should be confirmed to provide superior esthetic characteristics for the definitive CECD. Inset base for the denture base has been selected and noted. * AhHal et al.

19. When in doubt, a trial placement procedure is recommended to provide an objective evaluation of the definitive prosthesis before its fabrication. * AhHal et al.

20. Evaluate the distance from the incisal edge of the anterior teeth to the occlusal surface of the denture base. Ensure sufficient available posterior space for the denture base and the anterior teeth teeth, which will be in the relation of CECD type (monoplane or balanced). In a residual posterior space consider the use of resilient CECDs, which allow and bases anterior compressive strength. * AhHal et al.

AHHelal A, Goodacre B, Kattadiyil M, Swamidass R. Errors associated with digital preview of computer engineered complete dentures and guidelines for reducing them: A technique article. J Prosthet Dent 2018;119(1):17-25.

Evaluate the posterior maxillary denture base extension. Ensure extension to cover hamular notches, relief for pterygomaxillary raphe.

Evaluate posterior palatal seal dimensions

Evaluate border thickness and uniformity:
Too thin?
Too thick?

Turn on the Reference:
These are the files you have submitted.

Insure that the scan and the file transfer is representative of your patient's records.
This is why photos are so important as a reference in case something doesn't appear right

Ensure the midline aligns with reference and U/L midlines coincide

AvaDent Digital Setup: 515672-26628

Display Controls

Upper

| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

Reference

| | | |
|--------------|-----|----|
| Transparency | Off | On |
| Visibility | Off | On |

Lower

| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

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Compare previewed denture base extension to the provided image of the denture impression or the intraoral scan (the reference).

Ensure coverage of tuberosities, HN, RMP, buccal shelf

RMP appears to be "cut off"

AvaDent Digital Setup: 636342-63692 00

Display Controls

Upper

| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

Reference

| | | |
|--------------|-----|----|
| Transparency | Off | On |
| Visibility | Off | On |

Lower

| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

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RMP captured in final impression/reference

AvaDent Digital Setup: 636342-63692 00

Display Controls

Upper

| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

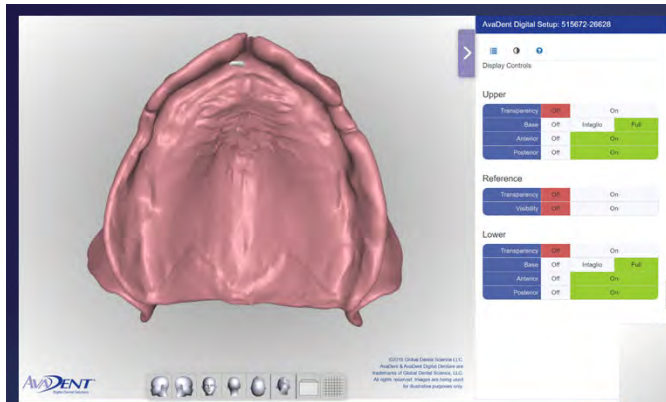
Reference

| | | |
|--------------|-----|----|
| Transparency | Off | On |
| Visibility | Off | On |

Lower

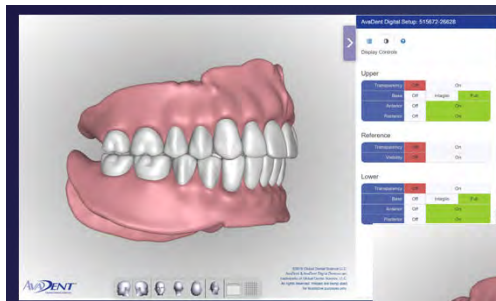
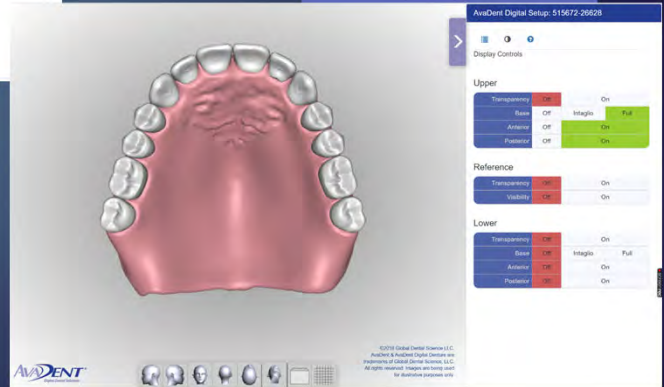
| | | |
|--------------|-----|----------|
| Transparency | Off | On |
| Base | Off | Intaglio |
| Anterior | Off | On |
| Posterior | Off | On |

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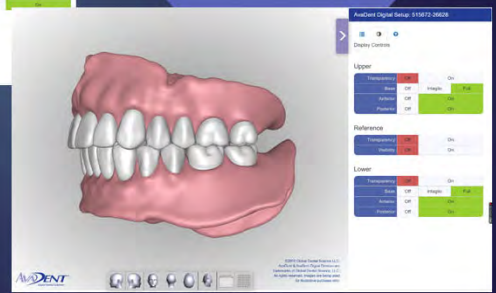
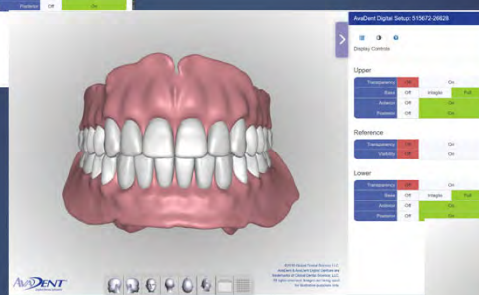
Notice the pattern of the rugae...
It can be reproduced on the cameo surface of the denture.

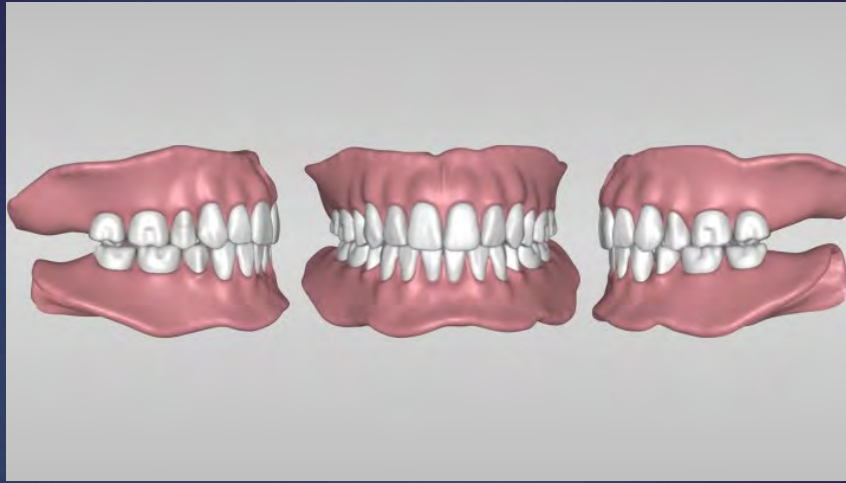
Are the rugae present, if requested?



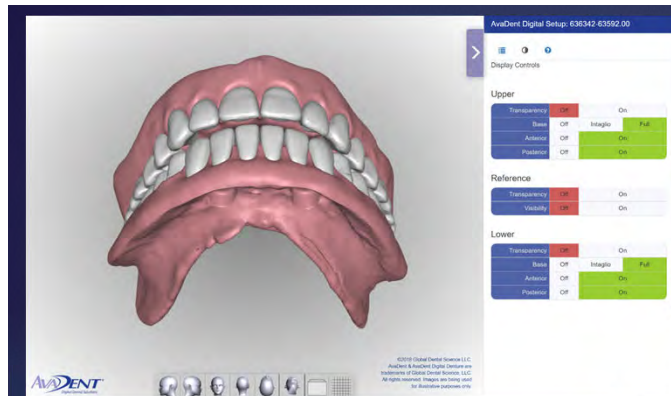
Verify set-up or changes requested from lab rx /
or appointment notes.

Evaluate tooth size and shape:
Do posterior teeth match anteriors selected?



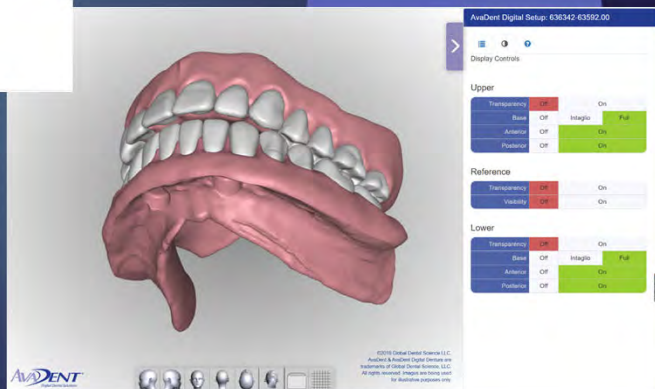


Check for absence of heel interferences



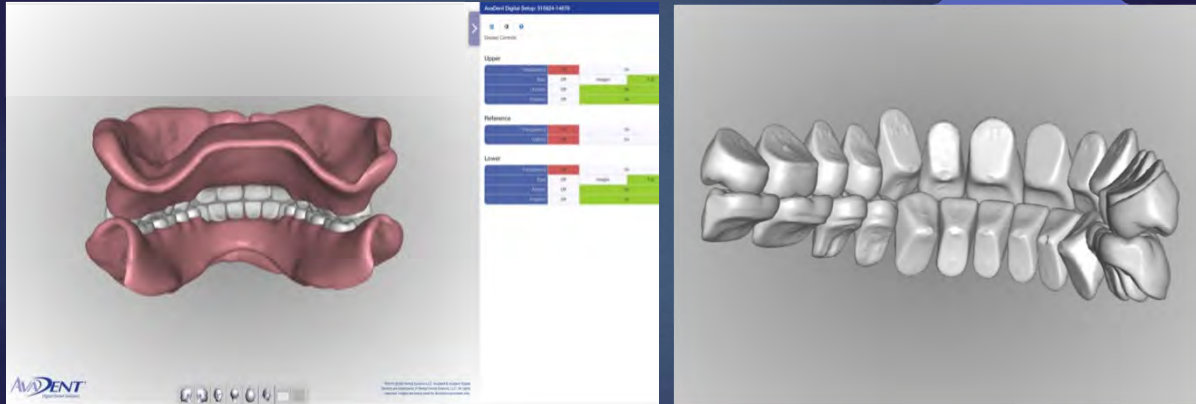
Insure no occlusal contacts in the anterior – no anterior contact in CR

Some set ups may have a DL contact on the maxillary canine, which general should not affect laterotrusion. If it does, will have to be adjusted



Evaluate requested tooth type and morphology for requested occlusal scheme:

Lingualized, anatomical, monoplane (flat or curve)

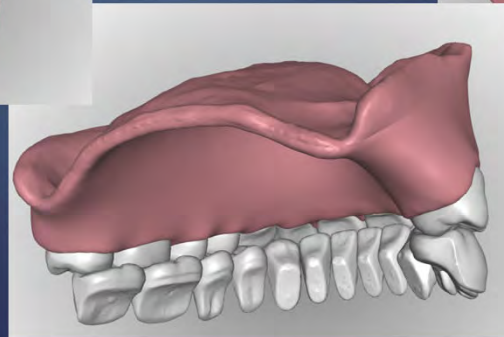
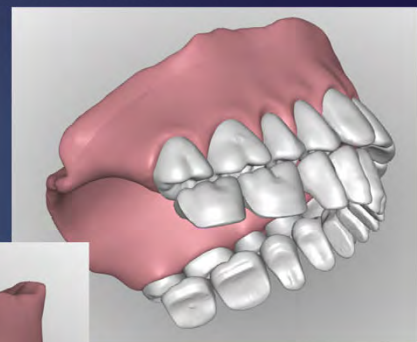


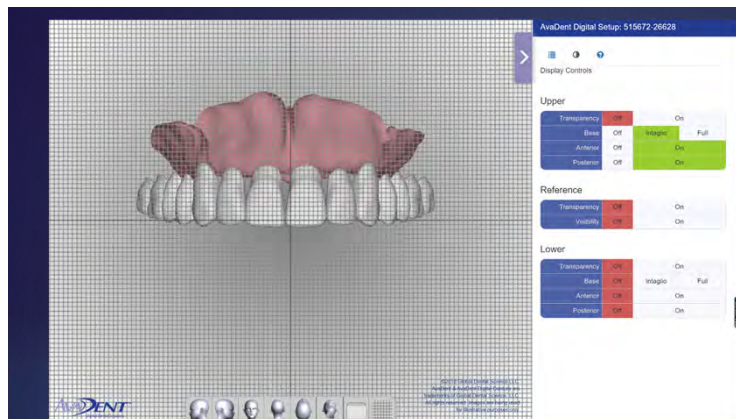
This is lingualized occlusion. With Bases removed – view tight occlusal contacts in posterior. Notice the lift of the buccal cusps not in contact (on purpose)

Buccal cusps of maxillary posterior teeth 1.5-2mm “reveal” or offset to lower buccal cusps to avoid cheek biting



U/L buccal cusps not in contact, only max lingual to mand central fossa to reduce lateral shear forces





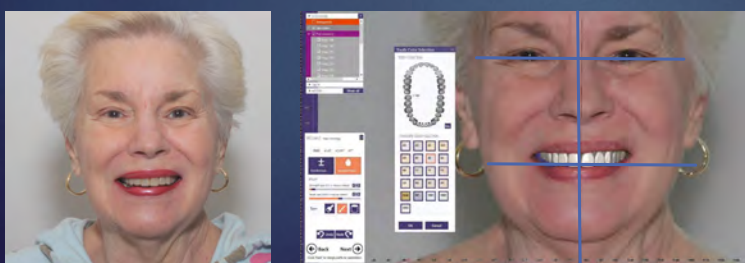
Evaluate the Horizontal Plane

Turn off everything except the maxillary teeth and the maxillary intaglio

Turn on the grid

The teeth, the intaglio and the X-axis should be parallel to one another

This information is obtained from your photos and your clinical records

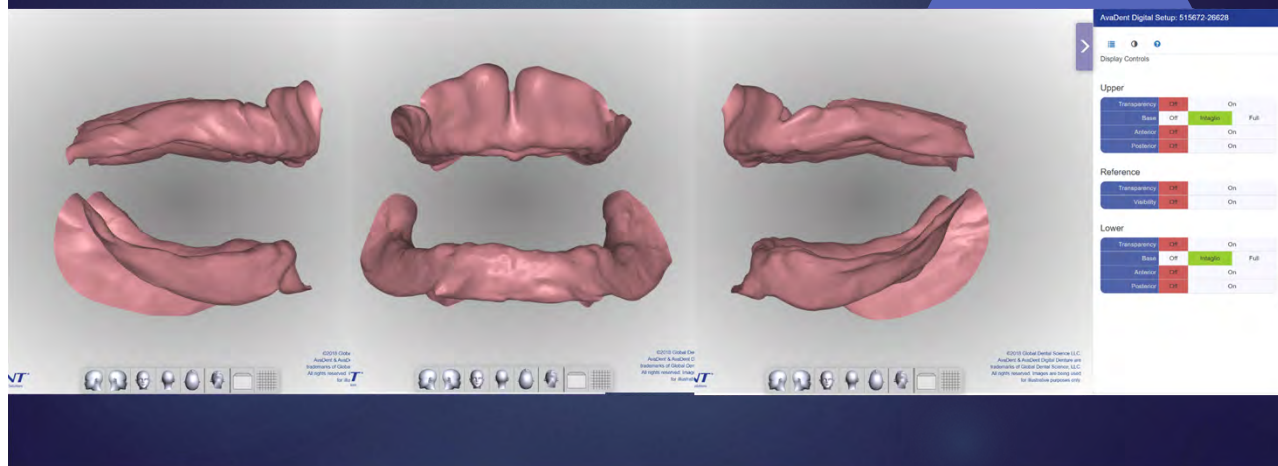


- ▶ Digital face-bow transfer technique using the dentofacial analyzer for dental esthetics and 2-D, 3-D smile design: A clinical report. J Oral Sci & Rehabilitation, C Brenes, et.al. July 2018

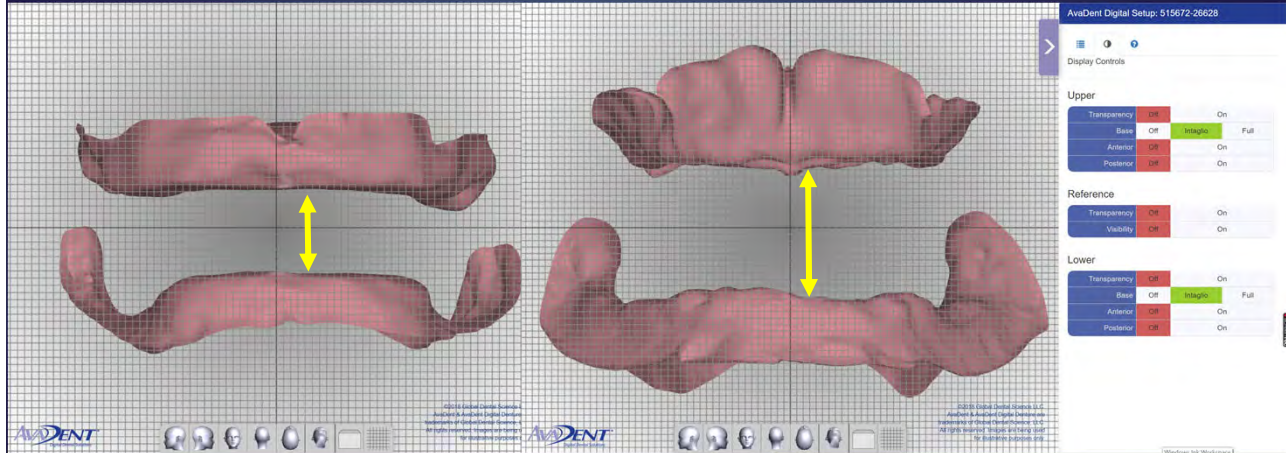
Are the ridges approximately parallel to one another, with the exception of irregularities in the ridges?

Maxillary and mandibular ridge parallelism has been reported to indicate appropriate VDO

Have the irregularities been noted for pre-prosthetic surgery?



Restorative space available? For the Dentures? 12mm minimum ridge to ridge for monolithic milled, 15mm minimum for analog



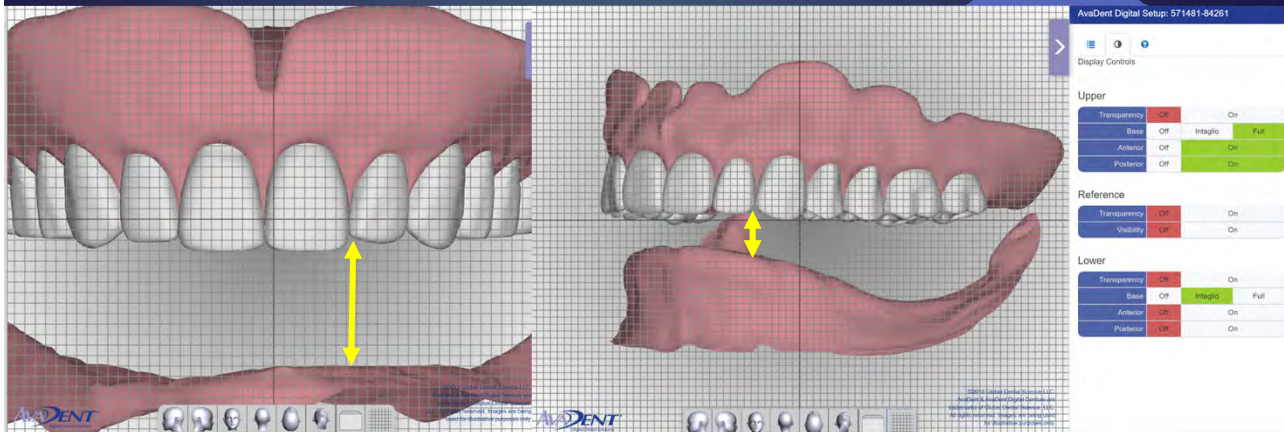
11mm before ridge recontour
for immediate denture

18-20 mm average

Restorative space available? Evaluate the previewed distance from the crest of the alveolar ridge to the occlusal surface of the denture teeth. Ensure sufficient available prosthetic space for the denture base and teeth. With reduced prosthetic space, or with an implant overdenture, consider the use of monolithic CAD/CAM dentures which will occupy less space without compromising strength,



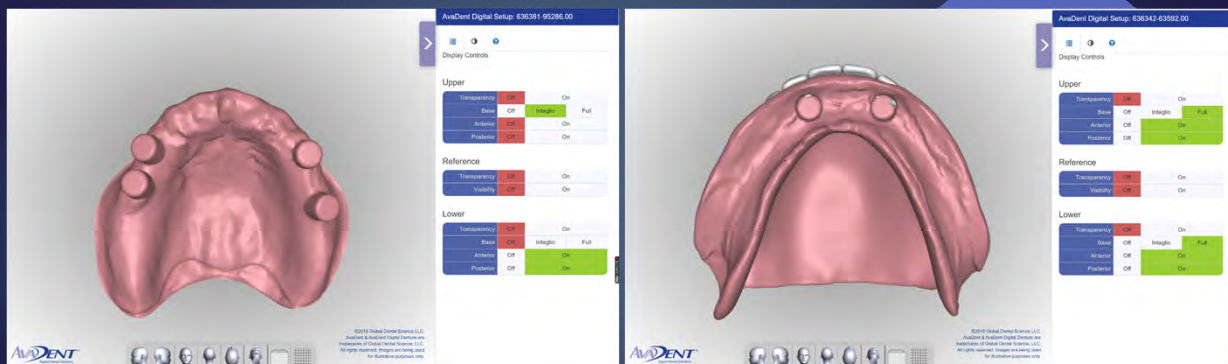
Restorative space available for Implant Overdentures? From the mandibular residual ridge to the occlusal plane. For the restorative components of the abutment, attachments, denture base and teeth. Minimum required 10 mm or alveoplasty (if possible) or alternative attachments



11mm available

4 mm – insufficient for implant attachments

Restorative space available for Implant Overdentures?
 Relief provided for abutment and attachment components?
 Denture will be returned with minimal need to retrofit.
 Denture still fabricated according to Removable Prosthodontic principles?

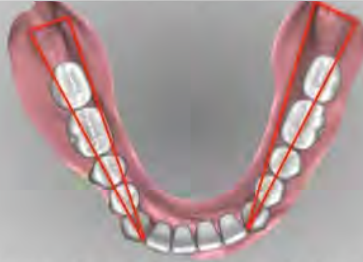


Evaluate tooth arrangement in relation to arch form:

Tooth arrangement should follow the arch form and be aligned with the alveolar ridge by following removable prosthodontic principles:

Central Fossae of mandibular teeth centered or slightly lingual to residual ridge

Pound Triangle- M of canine to RMP



Mandibular anteriors centered to the crest of ridge and not out past the labial vestibule



Evaluate tooth arrangement in relation to arch form:

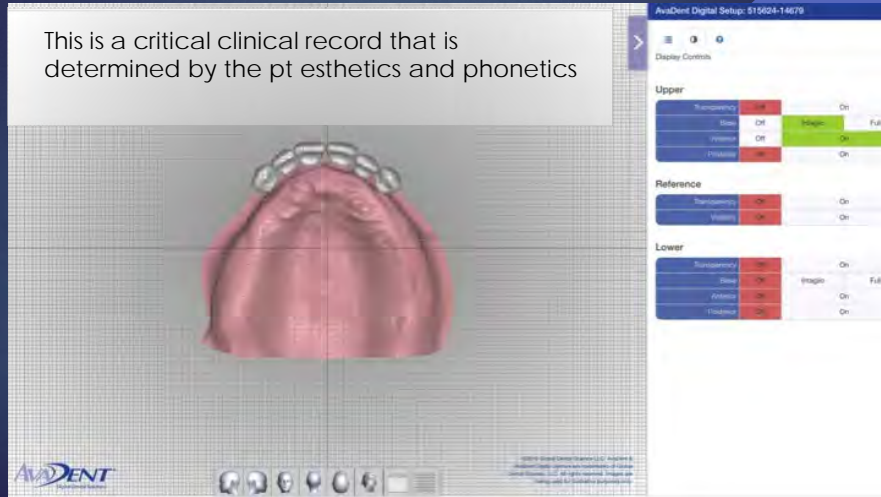
Tooth arrangement should follow the arch form and be aligned with the alveolar ridge by following removable prosthodontic principles:

If the maxillary posterior teeth appear to be encroaching into the vestibule, evaluate if they should be adjusted into cross bite

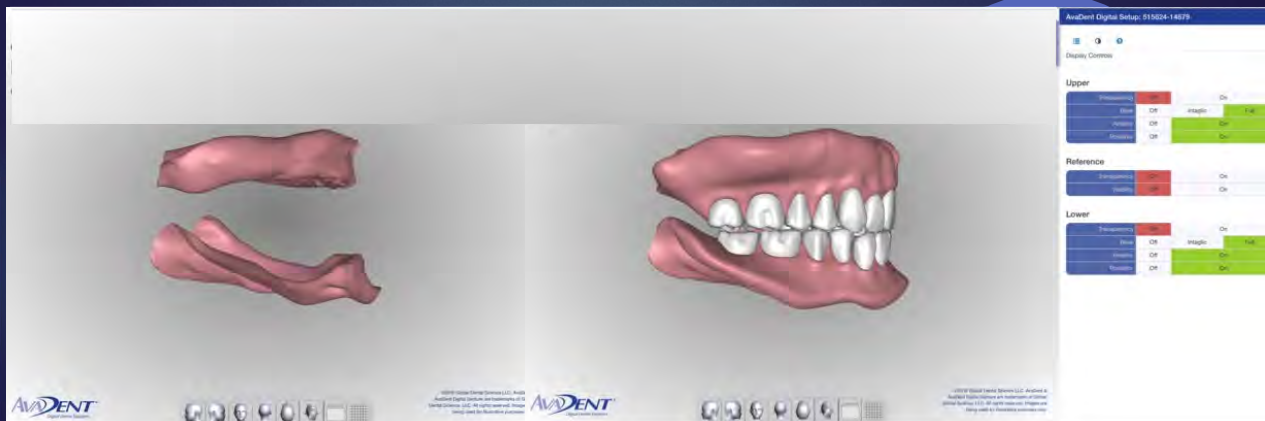


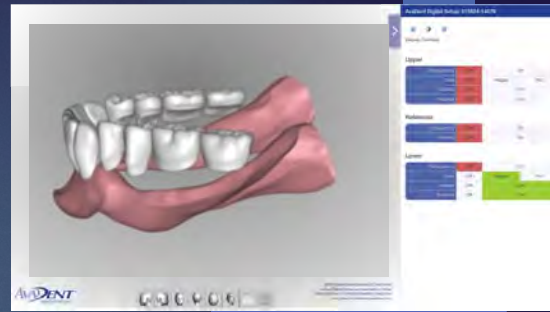
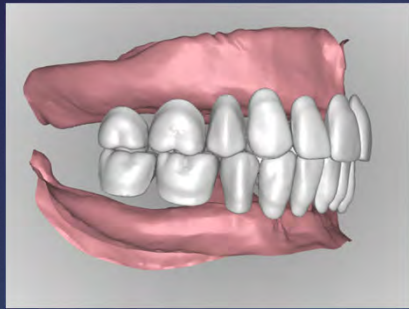
Evaluate the distance from:
 the most posterior point of the incisive papilla to the labial surface of the central incisors (10-12mm) or
 the most anterior point of the incisive papilla to the labial surface of the central incisors (6-8mm)
*in relation to the provided records **

This is a critical clinical record that is determined by the pt esthetics and phonetics



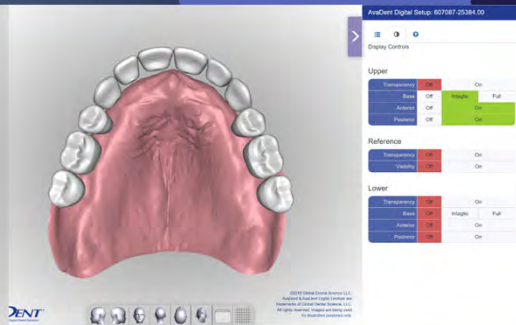
Evaluate the previewed occlusal relationship: Class 1, II, III
 Compare to the previewed horizontal and vertical overlap of the anterior teeth.
 Confirm a shallow incisal guidance.





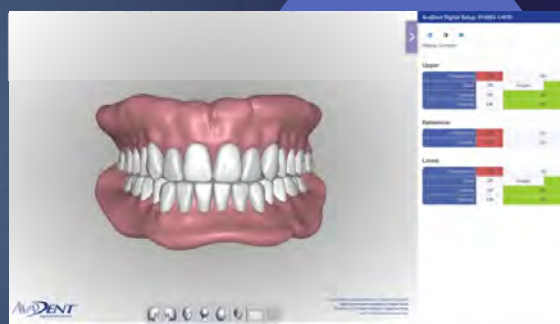
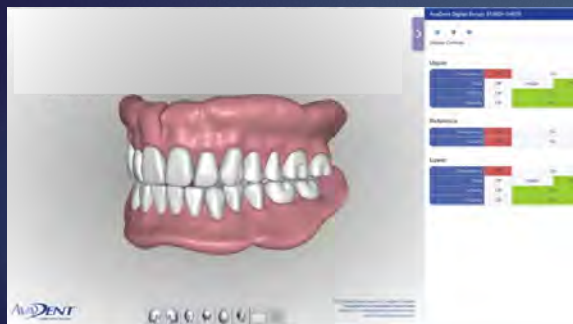
Exclusions?

Evaluate the most posterior mandibular tooth positions U/L (both sides) to ensure that they are not positioned on the ascending ramus, on an inclined plane or over the tuberosity



Final Evaluation:

Proper festooning and gingival height (determined by the tooth height) compared with the reference showing the high smile line. Customized anatomy, tooth position, rotation, tipping (if requested), stippling, ideal tooth embrasures and rugae should be confirmed to provide superior esthetic characterization. Ensure the denture base has been selected and noted.



A trial placement is recommended in most cases to provide an objective evaluation, a prototype of the definitive prosthesis, particularly if there were doubts during the collection of records or an intra-oral scan was taken.

Digital Denture Try In BTI, ATI or Printed Procedure

INSTRUMENTS AND SUPPLIES

- Removable Pros cassette
- Long piece of floss
- Heavy body PVS and tips
- LV & XLV and tips
- PVS Adhesive
- Bite registration material & tips
- 3 Impression Guns
- Tongue blade
- Marker
- Disposable blade and fine scissors
- Camera
- Slow speed handpiece straight attachment
- Acrylic burs

PRE-OPERATIVE TASKS

- “Have there been any changes to your health or medicines”? Take BP.
- Try in the try-ins with PIP and adjust sharp spots or pressure areas

APPOINTMENT TASKS - **AFTER** MAKING NEW IMPRESSION OR BITE RECORD IF NEEDED

- Take full face photo; profile; up close smile photos (all photos should show closed mouth, repose/slightly open, smile, and BIG smile) – **Before and After changes made**
- Vertical dimension changes: _____ **Check Sibilants** (How much does the vertical need to be changed from new bite record if needed? Specify + or -) - 3mm is limit
- Lip support - _____ (are the teeth set too facial or lingual?, check by looking at upper teeth on wet dry line of lower lip, check SH sound for lower teeth)
- Incisal edge position- _____ check **Fricatives, High Smile Line** (are the teeth too high or low?),
- Is there a **cant**? Teeth on L or R need to go UP or DOWN by how many mm? _____
- **Midline** circle UPPER or LOWER needs to go L or R how many mm? _____ (Verify occlusion)
- **Shade**: Avadent XCL1 Shade guide _____ or Dentsply Portrait _____ See page 8
- **Moulds**: Dentsply Portrait: _____ See page 8
- **Denture base shade**: circle one Fibered light, Fibered Dark (similar to 50:50), Extra Dark (similar to Lucitone Dark), Lucitone 199 Original Shade and Clear
- **Patient preferences**: Does the patient want changes to the set up or teeth? describe

- Class I, II, III, is it correct? _____
- Do any teeth need excluded (2nd molars, 1st premolars)? Rugae ok? Post palatal seal?
- **If minimal adjustments or changes > can sign off on a digital preview, if major changes, make those changes, take a new CR and discuss with me (will we need a new milled try-in?)**

How to evaluate the Try-in (BTI, ATI & printed) – In order:

- ▶ Flange extensions and width (May need to adjust to seat)
- ▶ Fit of intaglio, including post dam – may need to adjust with PIP to fit (like a denture insertion)
- ▶ CR & Occlusion (may need to adjust to perfect)
- ▶ Eval: Occlusal Plane

- ▶ Eval: Esthetics
 - ▶ Tooth Display, High smile line, Midline, Lip support

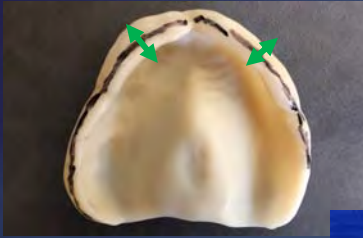
- ▶ Eval: Phonetics
 - ▶ Incisal edges, VDO

Try each arch in individually Checking the fit – Maxilla



1. If the Maxillary denture does not seat initially,
 - a. evaluate the length and thickness of the borders
 - b. Use PIP on the intaglio
 - c. Evaluate the PPS
2. If the Maxillary denture seats, has good retention, but then drops when the pt starts to speak,
 - a. Adjust the length of the denture

Try each arch in individually Checking the fit – Maxilla & Mandible



Length and width of
your flanges
A function of your final
impression



Border Width

A function of your final
impression

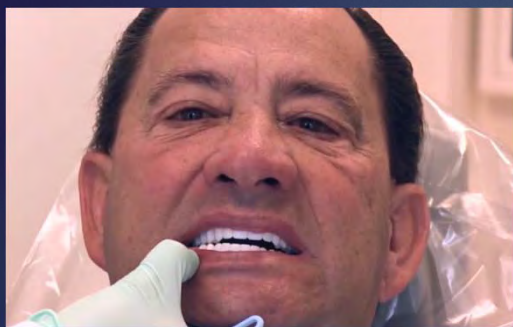


After significant adjustment
and no retention or stability...



If after adjusting each arch separately, you are not satisfied with the fit or retention, make a new wash in the intaglio of the trial denture (evaluate VDO first)

Next- Evaluate the Occlusion & VDO



- ▶ First, Check for Heel Interferences
intraorally
- ▶ If you still have the initial records you
can verify



Significant Occlusal or VDO Adjustment...

- ▶ Always take new CR record
- ▶ Always take new photos of BTI

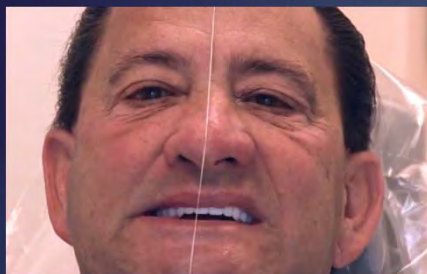


- ▶ If adjust > 1mm VDO
- ▶ If adjust occlusion and eliminate anatomy
- ▶ If some teeth are not in contact
- ▶ If no cusp / fossae contacts
- ▶ If a wash impression is made
- ▶ If midline is deviated after occl adj

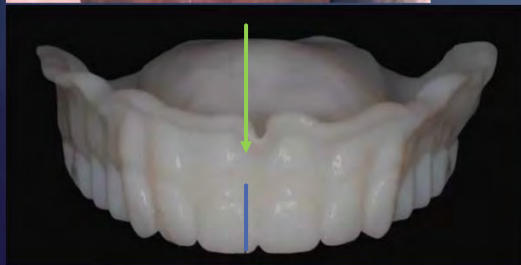


Evaluate Esthetics

Repose
(incisal edges)
&
Lip Support



Midline-
Draw &
score



Full Smile

Get
esthetics
consent



Take Photos Before and After Modifications / Adjustments

➤ Example



- BTI Try-in
- Class III patient

- Added wax to facial flange
- Upper lip more visible
- Higher smile line

DENTURE SHADE TABS



Avadent shades XCL1, XCL2 vs Portrait Shades

A1, A2, A3, A3.5, B1, B2, C1, C2, D2

BL30 is closest to a Vita OM3 or Portrait PW2

BN00 compares closest to an A1



AvaDent® Digital Dental Solutions Shade Guide



XCL-1

AvaDent Extreme Cross-Linked Material
Available In AvaDent Shades: BN00, BN10, BN20, BN30, BN35, Clear, YW10, YW20, GY10, GY20, RD20, BL00, BL30

| AvaDent Extreme Cross-Linked Material | Vita Classic | Remark |
|---------------------------------------|--------------|------------|
| BN00 | A1 | or Lighter |
| BN10 | A1-A2 | |
| BN20 | A2-A3 | |
| BN30 | A3-A3.5 | |
| BN35 | A3.5 | or Darker |
| CLEAR | | |
| YW10 | B1 | or Lighter |
| YW20 | B2 | or Lighter |
| GY10 | C1 | or Lighter |
| GY20 | C2 | or Lighter |
| RD20 | D2 | or Darker |
| BL00 | | |
| BL30 | | |

PRINTED

NextDent MFH Material
Available In NextDent Shades: BLEACH, N1, N1.5, N2

| NextDent MFH | Vita Classic | Remark |
|--------------|--------------|------------|
| BLEACH | B1 | or Lighter |
| N1 | A1-A2 | |
| N1.5 | A3-A3.5 | |
| N2 | B3 | |



Digital Complete Dentures Not Your Grandma's Denture Anymore...!

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Journées Dentaires Internationales Québec

Ronni A. Schnell, DMD, MAGD, FICD, FACD
Boston University Henry M Goldman School of Dental Medicine
May 27, 2024
rschnell@bu.edu

DISCLOSURES

BOSTON UNIVERSITY Clinical Professor, Director, Predoctoral Removable Prosthodontics
Boston University Goldman School of Dental Medicine

Dentsply Sirona Material Data Studies
Clinical Trials

THE CLASSIC SMILE Partner, Private Practice, The Classic Smile, Medford, MA

AvaDENT **Sterngold** Key Opinion Leader, AvaDent and Sterngold

straumann **UF** Support for CE Courses – AvaDent, Straumann and Ultradent

Images & Video:
Cropped
Rotated
Exposure
Accelerated video

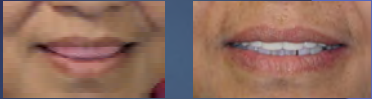
Patient consent on file for identifiable images

Key to Successful Dentures

- ▶ Knowledge of the **musculature** is the key to successful denture borders and optimal impressions
- ▶ Knowledge of **edentulous anatomy** and their predicted effects on the outcome of the denture
- ▶ Knowledge of optimal **esthetics** and how to achieve desirable results
- ▶ Knowledge and skill to manage **denture occlusion**: as compared to natural occlusion

Trends and Opportunities

- The fundamental prosthetics skills are pretty straightforward.



- Learning how to position the maxillary central incisors in the framework of the face, guides the position of every other tooth in the mouth.

Trends and Opportunities

- The typical dental student does not realize how important the fundamentals of denture fabrication will become, in the future and with more sophisticated/advanced treatments



Required Clinical Records Regardless of Technique

- ▶ Intaglio
- ▶ VDO
- ▶ CR
- ▶ Midline and horizontal plane
- ▶ Lip Support
- ▶ Tooth mould, shade, denture base shade
- ▶ PPS (if maxillary)
- ▶ Photos

* Analog or Digital
Occlusion Rim or Reference Denture

1. Final Impressions / Intaglio










6 Must-Haves for an Accurate Inter-Occlusal Record

Regardless of the technique

- ▶ Incisal Edge Position
- ▶ Lip Support
- ▶ Midline
- ▶ Vertical Dimension of Occlusion
- ▶ Centric Relation
- ▶ Anterior Tooth Size (at minimum) / Tooth and Denture Base Selection



Workflow – Analog v Digital

| Impressions | Records | Set-up | Try-in | Processing & Insertion |
|---|---|---|---|--|
|  |  |  |  | Conventional: Pack & Press Injection Pour |
|  |  |  |  | Digital: Monolithic milled Milled & bonded Milled & milled Milled & printed Printed & bonded Printed & milled Printed & printed Others... |



Show me the Evidence...

2012 – 2017 – “The first 5 years”
Milling vs. Early printing

Maeda Y, Minours, Tsutsumi S, Okada M, Nokubi T, A CAD/CAM System for Removable Denture. Part 1: Fabrication of Complete Dentures. *Int J Prosthodont* 1994;7:17-21

Kawahata N et al. Trial of Duplication Procedure for Complete Dentures by CAD-CAM. *J Oral Rehab* 1997;24:540-8


Clinical reports and technique papers...



- ▶ Pt Satisfaction Studies:
- ▶ Fit
- ▶ Accuracy
- ▶ Retention
- ▶ Adhesives


Material Studies

University of NY – Buffalo
University of NY – Rochester
University of Minnesota



- ▶ Wear
- ▶ Porosity
- ▶ Color stability
- ▶ Bond strength

Original Research



Lab on fit over conventional techniques... denture adhesives actually reduced the fit

Clinical on fit and satisfaction

Systematic Reviews – by 2017




Because there were so many studies

Minimal Shrinkage / Greater Accuracy

Comparison of denture tooth movement between CAD-CAM and conventional fabrication techniques

Brian J. Goodacre, DDS, a Charles J. Goodacre, DDS, MSD, b Nadim Z. Baba, DMD, MSD, c and Mathew T. Kattadiyil, DDS, MDS, MSD

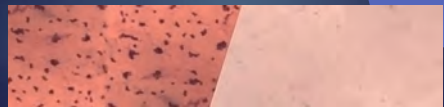
J Prosthet Dent 2012



SUNY Buffalo Department of Restorative Dentistry Tests Summary: Pre-Polymerized pucks of PMMA vs Conventional

▶ Acrylic Porosity Results:

- Shows no micro-porosity - resulting in negligible C. Albicans adherence
- Also found to be more hydrophobic



Conventionally processed Diamond D acrylic vs. AvaDent processed/milled Diamond D acrylic

SUNY Buffalo Department of Restorative Dentistry Tests Summary:



▶ Teeth Bonding Procedure Results:

- The bond exceeds ADA/ISO requirements

▶ Color Stability Results:

- Is more color stable than traditionally processed dentures

▶ Residual Monomer Results:

- Has 20% less residual monomer than conventionally fabricated dentures

Material Studies – Milled vs. Early Printed

Early Printed:

- Esthetics
- Brittle
- No fracture toughness
- To increase strength, many labs were printing the trial denture in a single color and “coloring” the denture base:
 - Porous
 - Habitat for fungus



Multi-layered Teeth and Sharp Gingival Margins a Monoblock Monolithic (milled) Puck

Single vs. Multilayered teeth

Current Generation CEJ

Courtesy of AvaDent

Denture Base Options with Rugae

Courtesy of AvaDent

Current Research Focus... 2018 – Present:

- ▶ Introduction of:
 - ▶ Intraoral scanning
 - ▶ Digital records capture
 - ▶ Material engineering

Milled & Printed

Inoclar

Baltic

Lucitone Digital Print on Carbon 3-D

AvaDent

Monolithic Milled vs Individual Teeth

Courtesy of AvaDent

Monolithic Milled vs Individual Teeth

AvaDent monoblock

Traditional

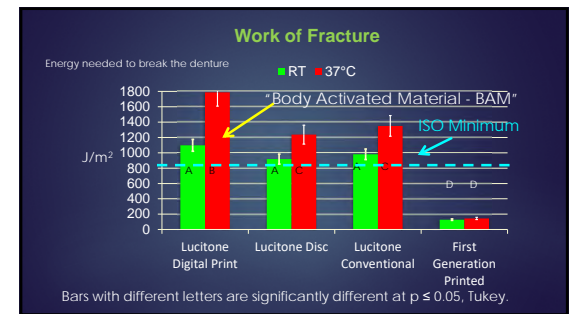
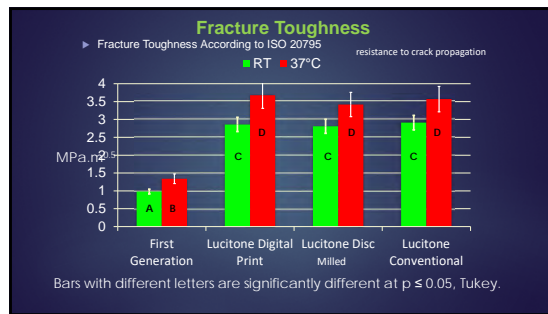
Monolithic Teeth contribute to its strength

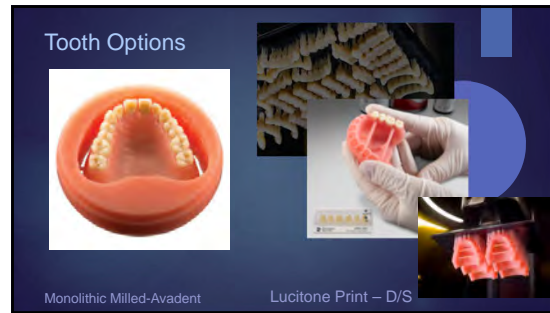
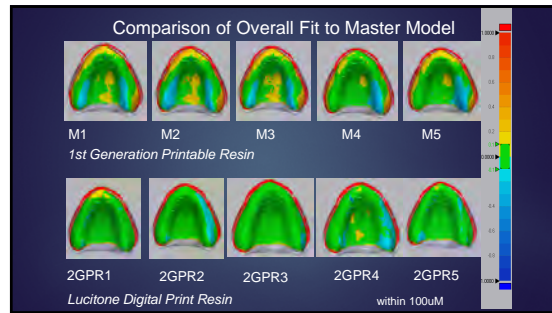
Only the denture base contributes to its strength

Material Data Studies at Boston University School Of Dental Medicine ISO 20795

1. Lucitone Digital Denture Base Resin
2. "First Generation" Digital Denture Base Resin
3. Conventional Acrylic
4. Milled Digital Denture Disc

Courtesy of Dr. Russell Giordano





Digital Options - Comparisons

AvaDent Monolithic Milled

- Utilizes an infinitely small amount of inter-ridge space >12mm, if necessary...

Lucitone Print - D/S

- Minimum inter-ridge requirement 11mm
- Algorithm will not allow you to proceed to the next step, if < 15 mm

A perforation of the denture is not possible due to the teeth being bonded

The ridge lap will be milled off during denture milling



Digital

Digital processes give us a more effective way to interact with our patients

Transitioning from analog to digital to analog presents certain challenges

DIGITOOL

Fundamentals are still requisite for fabrication

The Digital Process:

- The digital process can accomplish all of these steps too, but in a different way:
 - Impressions are scanned with machines
 - Machines directly scan the patient's anatomy intraorally
 - Physical records transfer the data as reference scans
- We ultimately end with a virtual patient
- So why digital?

The Digital Process:

- A CT scan
- A digital gothic arch tracing
- A digital facebow registration
- Custom mandibular movements
- Virtual articulation
- Reproducible occlusal schemes
- And facial scans

UTS CAD (Ivoclar)

Dr. Valérie Cooper

Many Techniques for Clinical Records

Intra-oral scans

Wagner Try-in

Various Devices Duplicate Denture Reference Denture Wax Rim Technique

Wax Rim or Reference Denture?

Wax Rim Technique

- No existing denture
- If current denture... completely unserviceable

Reference Denture Technique

- KEY for simplifying digital denture workflow
 - capturing key records in patient's own denture is more accurate
- Must have existing denture
- PREFERRED TECHNIQUE... VDO and CR acceptable or "correctable" prior to impressions and CR record

Digital Denture Checklist...

The Power of the Checklist



Table of Contents:


| | Pages |
|---|-------|
| ▶ Complete Denture Workflow | 2-3 |
| ▶ Clinical Techniques | 4-5 |
| ▶ Clinical Records Required | 4-5 |
| ▶ Set-up & Appt Tasks | 6-9 |
| ▶ Checklist for send out a case | 10 |
| ▶ Req'd Photos - Wax rim technique | 11-12 |
| ▶ Req'd Photos - Reference Denture | 12-13 |
| ▶ Req'd Photos - Interim/Immediate Denture | 13 |
| ▶ Lab Rx template - for BTI | 14 |
| ▶ Lab Rx template - for final milled dentures | 15 |
| ▶ Digital Preview Evaluation | 16-30 |
| ▶ BTI Try-in | 31-35 |
| ▶ Denture Shade Tabs | 36-37 |

For Occlusion Rim Technique, After completing interocclusal records:

- ✓ Prepare photos
- ✓ Prepare Work Authorization (Lab Rx)

Occlusion Rim Technique

Current Denture



Repose Smile


Courtesy of Dr. Ya-Ting Yu

Occlusal Rims



Repose Smile

Retracted Occlusal Rims in CR - WITH Midline, Canine & High Smile Line Drawn




Retracted Edentulous - with ridges PARALLEL




Maxillary and mandibular ridge parallelism has been reported to indicate appropriate VDO

This will also be compared to your mounting and the scanned ridges

And Mounting (optional)...



Posterior Palatal Seal



Verify that post dam is prepped into final cast, so that it can be captured and incorporated when scanned

Case is Submitted – Sample Rx pgs 15 & 16

Scans

Case is submitted...
www.avadent.com

For Reference Denture Technique,
Case must be scanned during clinical appt:

- ✓ Ensure that tech/assistant will be available to scan during clinical appointment
- ✓ Clinical appointment photos

Reference Denture Technique

Dr. Kristina Gauchan, Mill Kollara, Dayana Escobar 2020

Required Clinical Records

- ▶ Intaglio
- ▶ VDO & CR
- ▶ Midline and horizontal plane
- ▶ Lip Support
- ▶ Tooth mould, shade, denture base shade
- ▶ PPS (if maxillary)
- ▶ Photos

2 most important things to know and capture during Reference Denture Technique

Use the thinnest amount of final impression material and bite reg material

Do Not Increase VDO...!

Dentures (impressions) and Bite are Scanned

- Intraoral
- Benchtop

Denture is cleaned and returned to patient at same visit

- Use adhesive sparingly
- Use alcohol to remove adhesive after impression removal

Scans with inEos X5

Files are submitted...
www.avadent.com

Case is Initiated with Rx

Digital Preview

Trial dentures can be Milled or Printed

Subtractive Manufacturing Additive Manufacturing

- Pt wears it for an extended period
- Exact shade match
- Short term - try in only
- Shade not critical or if match available

Trial Denture (BTI - Biofunctional Try-in)

Clinical Examples

THE Occlusion Rim Technique

Current Immediate Upper / Lower Final impressions, Inter-maxillary records

Digital Preview

PPS is carved into final cast before scanning

Note the midlines and canine lines dropped and scored on lower rim, as well

Digital Setup:
575666-18889

BTI Try-in

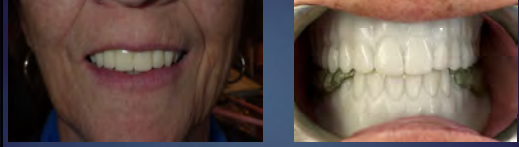
Adjustments needed just to insert - Adjusted occlusion slightly

BTI Try-in

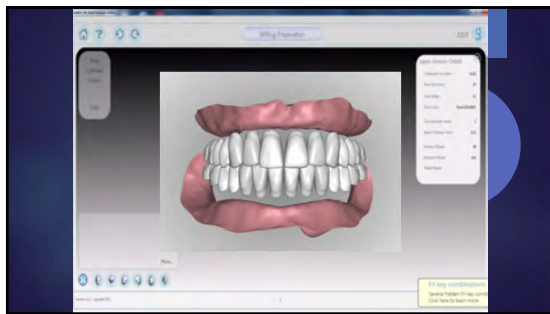
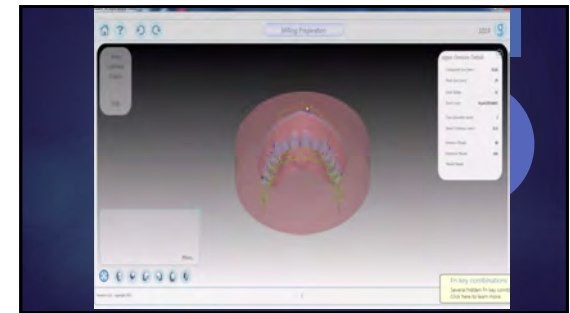


- ✓ Ensure that the midlines are coincident
- ✓ Adjust the occlusion, if not, to restore the midlines
- ✓ Take new bite in full bilateral contact @ accurate VDO
- ✓ Take photos


BTI Try-in



Clinical photos:
Full Face & Close Up... Smile + Repose




Same expected adjustments needed @ insertion
Clinical remount done to perfect occlusion



Clinical Example

Reference Denture Technique


Drs. Dayana Escobar and Manavi Nagal 2021



Wash & Bite Scan Digital Preview



Patient's own dentures BTI Try-in BTI after Adjustments & New Bite



Patient's own dentures Patient's New Dentures



Lang Denture Duplicator

- The denture is embedded in this special duplicating flask with alginate on both sides, registering both the polished and intaglio sides.
- When the denture is removed, the space left by the denture can now be filled with clear ortho resin and a clear duplicate of the denture will be created.

- Duplicated denture
- Re-fit intraorally (intaglio & occlusion)
- Record repose & HSL
- Final Impression
- CR

- ▶ Intaglio - Final Impression wash Impression
- ▶ VDO
- ▶ CR
- ▶ Midline and horizontal plane
- ▶ Lip Support
- ▶ Tooth mould, shade, denture base shade
- ▶ PPS (if maxillary)
- ▶ Photos

Clinical Example

Reference Denture Technique with Modifications to Denture

10 year old CU/CL

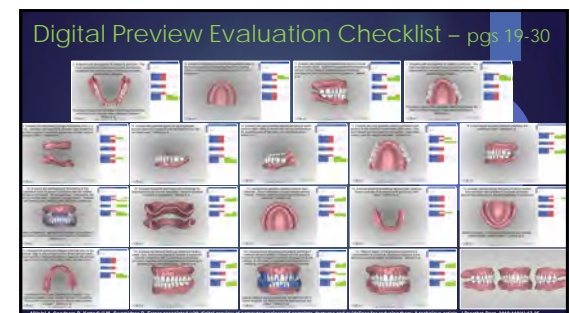
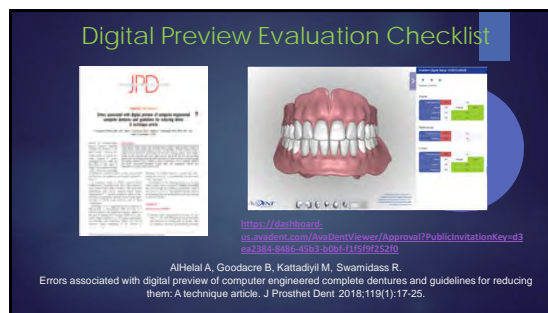
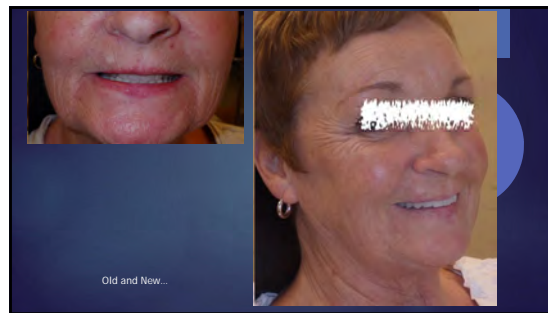
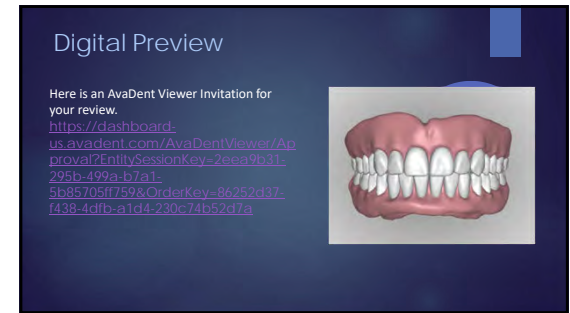
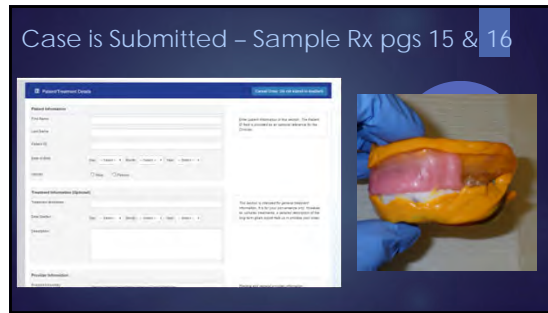
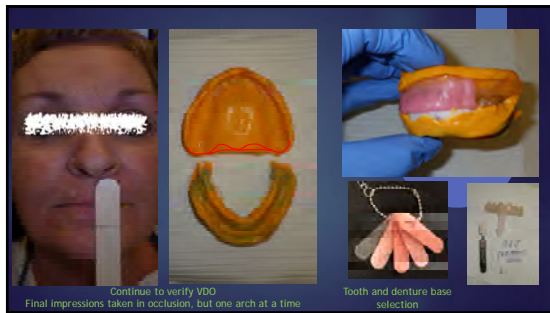
Patient wanted no part of me duplicating these dentures, but I had a good feeling about what could accomplish here

Use PIP to verify the fit of the duplicates & adjust the occlusion, if needed

Most duplicate dentures need the CR record 1st @ VDO to insure it does not change

Establish VDO
This case needed +1 (hence the Vanilla-mousse)
Otherwise, I use only Aluwax

- Then I added lip support to raise up lip to show more tooth and provide lip support
- Incisal edges parallel to lower lip



The BTI Try-In

THE "SECRET SAUCE" OF THE DIGITAL FABRICATION PROCESS

WHAT TO DO WITH A "TOOTH-COLORED" DENTURE!

BTI – Bio-Functional Try-In

- ▶ All-resin PMMA Trial Denture
- ▶ Milled or printed entirely in the actual tooth shade*
- ▶ Fully functional denture
- ▶ Accuracy – can assess retention with 100% certainty
- ▶ Pt can take home for prototype or spare
- ▶ Used for radiographic and surgical templates

Courtesy of Dr. Lars Bouma

BCTI – Bio-Functional Try-In – *Printed two-color monolithic

- Printed monolithic try-ins
- Stratasys inkjet technology
- More dimensionally accurate than DLP printing so...
- Very good for short-term temporary denture and strong enough for a try-in
- Tooth esthetics not fully developed / more opaque denture base than PMMA
- Vita & Lucitone Classical shades

How to evaluate the Try-in pgs 32-36

- ▶ **Flanges** – extensions and width (may need to adjust to seat)
- ▶ **Intaglio and Post Dam** – check with PIP
- ▶ **Occlusion, Occlusal Plane and CR**
- ▶ **Phonetics**
 - ▶ Incisal Edges and VDO
- ▶ **Esthetics**
 - ▶ Tooth display, High Smile, Midline, Lip Support

Think of it as a denture insertion...

Try each arch in individually Checking the fit – PPS

1. If the Maxillary denture does not seat initially,
 - a. evaluate the length and thickness of the borders
 - b. Use PIP on the Intaglio
 - c. Evaluate the PPS
2. If the Maxillary denture seats, has good retention, but then drops when the pt starts to speak,
 - a. Adjust the length of the denture

Try each arch in individually Checking the fit – Intaglio

Pressure Indicating Paste

Fit Checker

- Support, stability, and extension
- Show through / tissue impingement

Try each arch in individually Checking the fit – Borders

Length and width of your flanges
A function of your final impression
IO scan
Cast

Next- Evaluate the Occlusion & VDO

Evaluate Esthetics

Repose (incisal edges) & Lip Support

Midline-Draw & score

Full Smile
Get esthetics consent

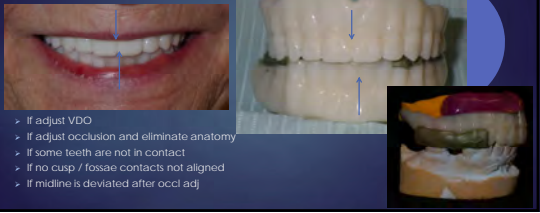
Retention and stability...



If after adjusting each arch separately, you are not satisfied with the fit or retention, make a new wax in the intaglio of the trial denture (evaluate VDO first)

Occlusal or VDO Adjustments... Esthetic Modification...

- ▶ Always take new CR record @ VDO
- ▶ Always take new photos of BTL

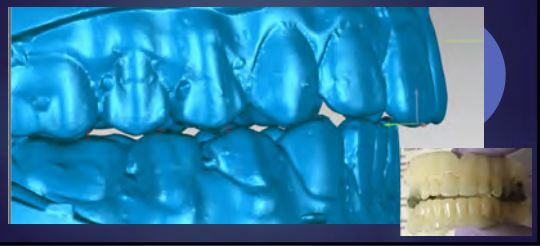


- ▶ If adjust VDO
- ▶ If adjust occlusion and eliminate anatomy
- ▶ If some teeth are not in contact
- ▶ If no cusp / fossae contacts not aligned
- ▶ If midline is deviated after occl adj

Ensure Bite Record is Taken @ VDO

...and doesn't hide CEJ's of teeth

No teeth in contact on CR?
VDO will be increased in the software



A BTL try-in from an unsuccessful interocclusal record

IN OTHER WORDS - WHAT EVER COULD GO WRONG... DID!!

BTL Try-in

- Excessive VDO
- Occlusal plane to low
- High smile line
- Incisal edges in repose

CR incorrect

BTL Try-in

- Make all of your changes in the BTL as though they were occlusion rims
- Take a new CR record - this time @ VDO

The new scan and digital design preview will show the new set up and the previous tooth set (your BTL) up as your reference for comparison

| Upper | Reference | Lower |
|-------|-----------|-------|
| 1.0 | 1.0 | 1.0 |
| 2.0 | 2.0 | 2.0 |
| 3.0 | 3.0 | 3.0 |
| 4.0 | 4.0 | 4.0 |
| 5.0 | 5.0 | 5.0 |
| 6.0 | 6.0 | 6.0 |
| 7.0 | 7.0 | 7.0 |
| 8.0 | 8.0 | 8.0 |
| 9.0 | 9.0 | 9.0 |
| 10.0 | 10.0 | 10.0 |

Final Dentures

BTI try-in Case 2

- ▶ The upper BTI was overextended from canine to canine area. We had to reduce the labial flanges by 2 mm. Also
- ▶ The lower BTI was overextended from molar to molar on buccal side. We had to trim the denture by around 4-5 mm on both left and right sides buccally.
- ▶ The mandibular midline was shifted by 2 mm to left side. We have marked the same on BTI. And sent photos via Datamotion.

Next clinical visit:

- ▶ The occlusion was adjusted to bilateral contact (no "hit and slide")
- ▶ If the midline does not return to coincident, then CR was not correct to begin with
- ▶ A functional impression was taken with PVS-XVL -after trimming the borders. Retention was not as expected
- ▶ CR was captured @ VDO with Aluwax in tooth to tooth contact

BTI try-in Case 3:

Always check tooth position and take photos both before & after Aluwax bite

BTI Try-in Retracted Occlusion Post-adjustment

BTI Try-in - with Bite registration material in place

What do you see?
Is this correct?
Why? Why not?

Reference Denture Modifications:

- Subtraction
- Addition
- Midline
- VDO
- Lip Support

Dr. Hesham Farag and Dayana Escobar 2021

Reference Denture Modifications:

- VDO reduced & Occlusal Adjustment
- Marked high smile line and midline
- Defined incisal edge & horizontal plane
- Addition of lip Support - L
- Wash Impression - U/L
- CR record @ VDO
- Ready for scanning
- Digital preview with changes incorporated

Dr. Hesham Farag, Dayana Escobar 2021

New Reference Denture Insertion

Dr. Hesham Farag, Dayana Escobar 2021

BTI take home messages:

When to take a new CR record and Scan

- ▶ If any occlusal adjustments
- ▶ If some teeth are not in contact @ correct VDO
- ▶ If no cusp / fossae contacts
- ▶ If a wash Impression is made (always in function!)
- ▶ If midline is deviated after occlusal adjustment
- ▶ **Always** take photos: repose, full smile (full face and close up) and retracted in occlusion
- ▶ Use Aluwax, or Clear Bite not Blu-mousse - tooth to tooth contact - @ VDO
- ▶ Check the CR Record before dismissing the patient

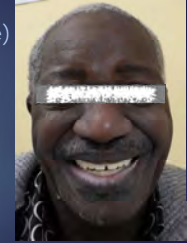
Full Face & Close Up... Smile + Repose

BTI in full contact after occlusal adjustment, if needed, with & w/o Aluwax



The Many Lives and Uses of a BTI

A Prototype (Immediate/Interim Denture)

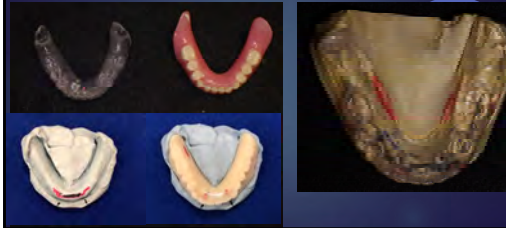


A Pair and a Spare



Duplicate Lower Denture Radiographic Guide

1. Between Canines/Laterals
2. Straight line placement
3. Ideally - 15mm
 - o Minimum 10-11mm apart



Space Analysis - Analog vs. Digital

For patients for whom you have their BTI's:



A Provisional CU/IL → OL



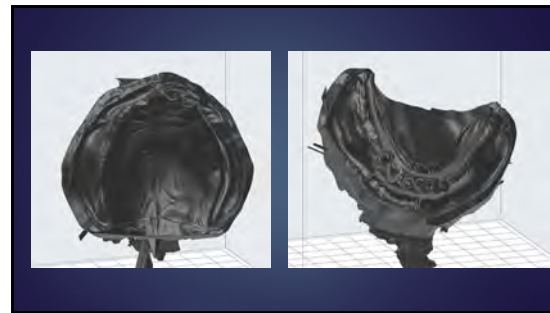
Immediate Dentures (2-stage extractions strongly advised)

- ▶ Final impressions
- ▶ Inter-occlusal records
- ▶ Mark midline and desired changes, as needed
- ▶ Record Post Dam, Tooth & base selection and Photos



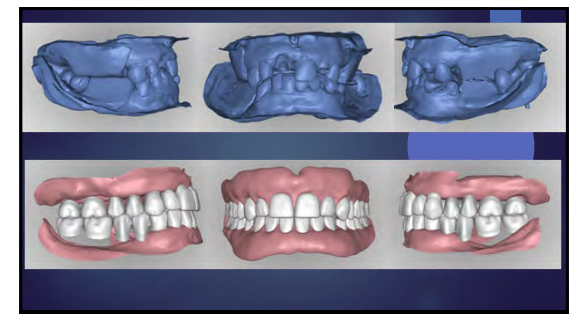
Clinical Example & Photos:

If no IMP, Wax Rims @ VDO



Clinical Example:

► The Interim Complete Upper / Lower



Virtual ridge reduction & bone recontouring template fabrication

Space Analysis

- Bone Reduction Guide designed
- Matches intaglio of denture

Bone Recontouring Templates for Alveoplasty

Extraction Sites, Alveoplasty & Sutures



Clinical Example:

► The

Interim Complete Upper / Provisional Lower

Partial BTI Try-in:

1. Esthetic Try-in
2. If there are sufficient posterior teeth to scan intraorally, in case a new CR record is needed

Repose

Smile

No Occlusal Rims

Drs. Dayana Escobar, Mohamad Srour & Jessy Ajram

Repose

Smile

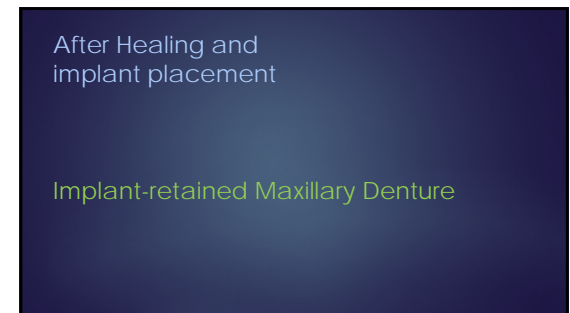
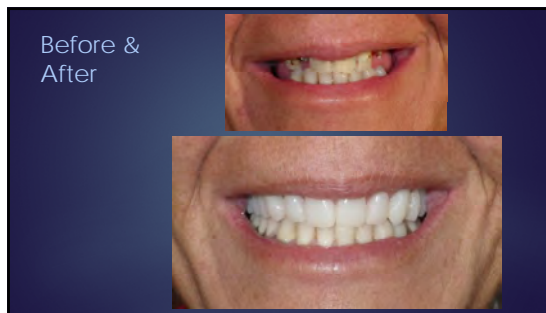
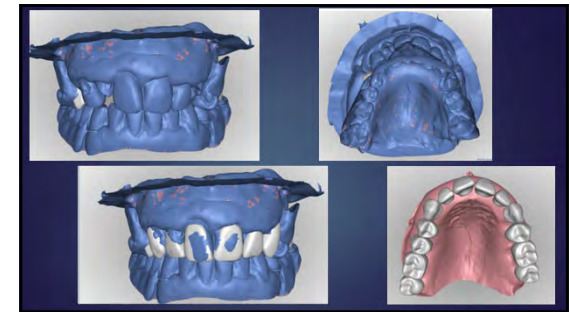
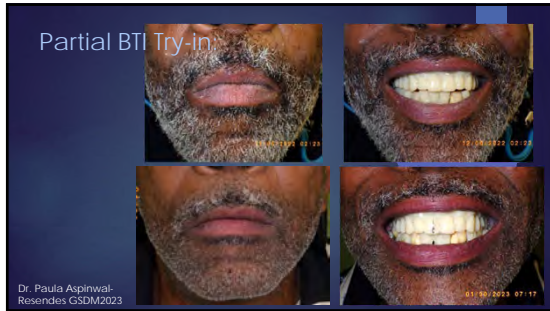
Occlusal Rims

Wax Rims & Articulation

BOSTON UNIVERSITY HENRY M. GOLDMAN SCHOOL OF DENTAL MEDICINE

PPS

BOSTON UNIVERSITY HENRY M. GOLDMAN SCHOOL OF DENTAL MEDICINE





Framework Design

Immediate vs. Definitive Dentures

Implant Overdenture - With "Digital Reline"

IMPLANTS PLACED - ALVEOLAPLASTY DONE - HEALING COMPLETE - ABUTMENTS PLACED

Fundamentally the same as the Reference Denture Technique

BTI Try-in and Space Analysis

SICAT Planning Report - Overview

Please evaluate for implant placement #22 & 27. Please reduce the height of the mandible as indicated on plan 3-4mm to level bone and also for restorative space. Thank you. Dr. Schnell

Impression in FUNCTION
Bite in ALUWAX in full CONTACT

NEVER NEVER POUR a Reference Denture Impression - Scan IT!

Impression and scan of Intaglio, scan of cameo, scan of buccal bite and scan of opposing denture

<https://dashboard.us.zenidigital.com/Analytics/149/proxy?EntitySessionId=149&EntityId=149&EntityName=24159-7161278&EntityParentId=149>

The attachments were picked up chairside about a week after insertion to ensure all sore spots and occlusion has been adjusted

Processing housings

Retention Rings

NARROW DIAMETER
IMPLANTS PLACED
ALVEOPLASTY
HEALING COMPLETE
ATTACHMENTS
ACTIVATED

Implant Overdenture with "Digital Reline"

Fundamentally the same as the
Reference Denture Technique

EXTRACTIONS &
IMPLANTS PLACED
HEALING
COMPLETE
WASH IMPRESSION
& BITE
ATTACHMENTS
ACTIVATED

Immediate Implant Overdenture with "Digital Reline"

Fundamentally the same as the
Reference Denture Technique

