

Digital Splints: Diagnosis, Design and Fabrication Options, & Splint Resin Possibilities

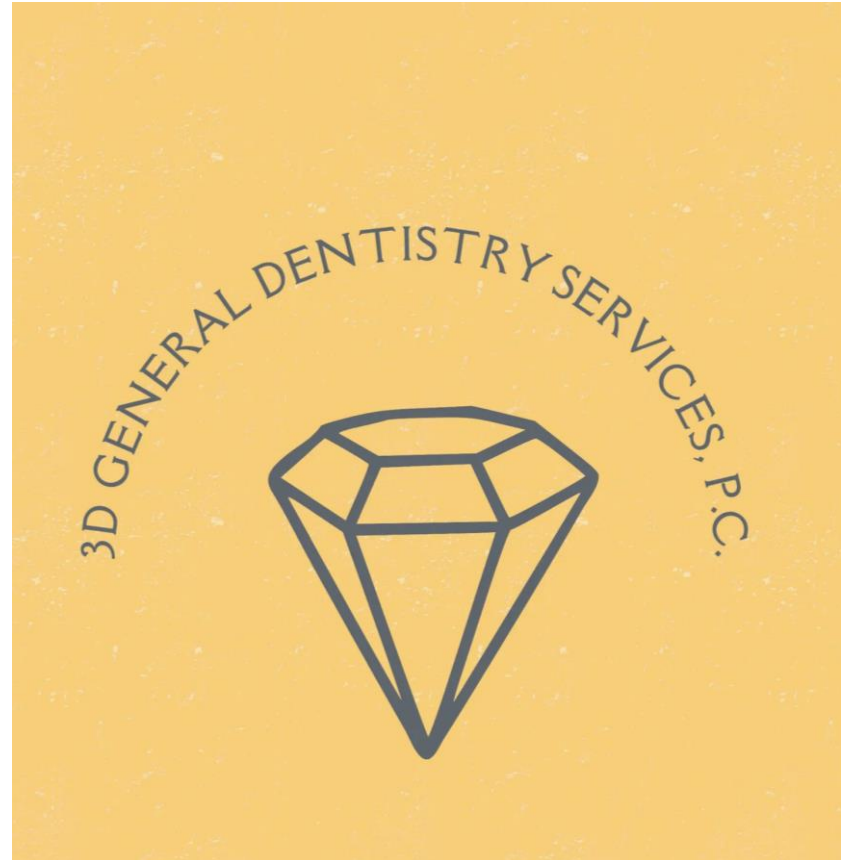
ALDA District 3

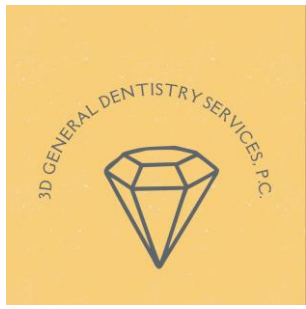
Dothan, AL

September 19, 2025

Barry E. Goodspeed, DDS

3D General Dentistry Services, P.C.





Course Objectives

1. Review **Diagnostic Steps** for evaluating TMJ and Bruxism Disorders.
2. Review recommended **Digital Records** needed for an efficient design, fabrication, and chairside delivery of a digitally produced bruxism splint.
3. Become familiar with the workflows of different Digital Splint software applications.

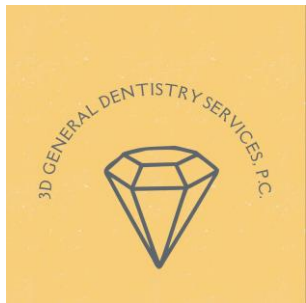
inLab Splint App

DS Core Create

Medit Splints

3Shape Automate

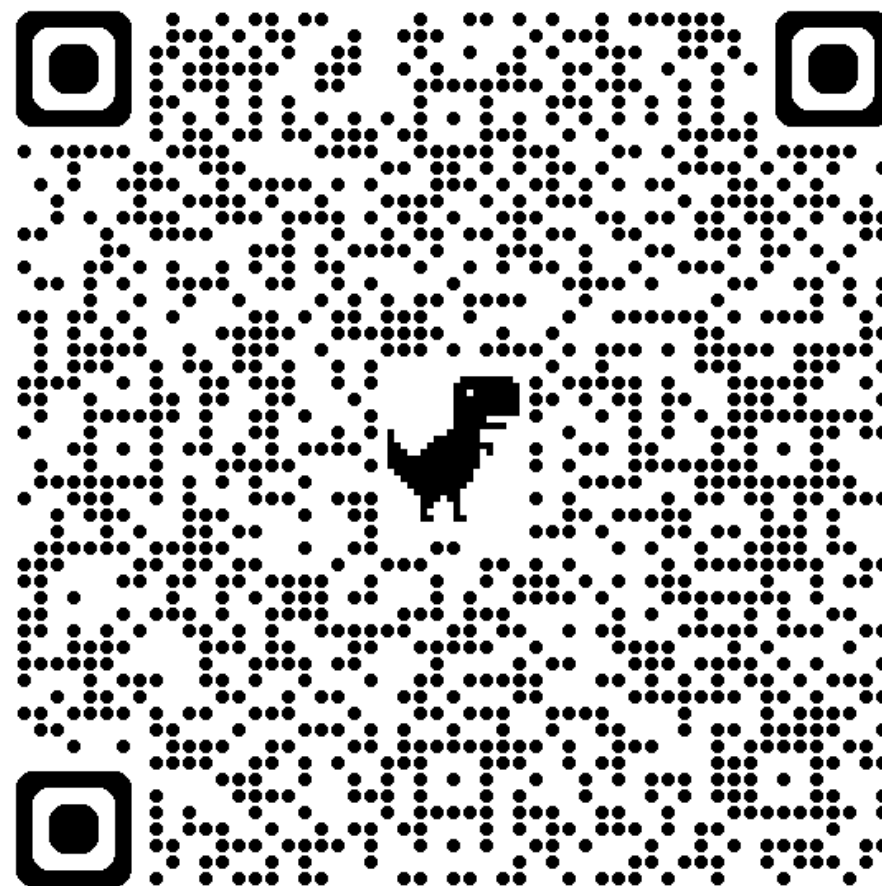
4. Review Dr. Nate Lawson's Wear + Biaxial Flexural Strength data of most prominent **Splint Resins**.
5. Compare several prominent **3D Printers**.
6. Bonus review of designing and direct printing **Retainer** or Bleaching Tray (modeless) and possible use of splint resin as a **Partial Framework**.

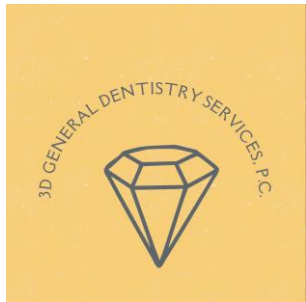


Resources

Splint Resources. ALDA District 3. pdf

3DGDservices.com/Resources



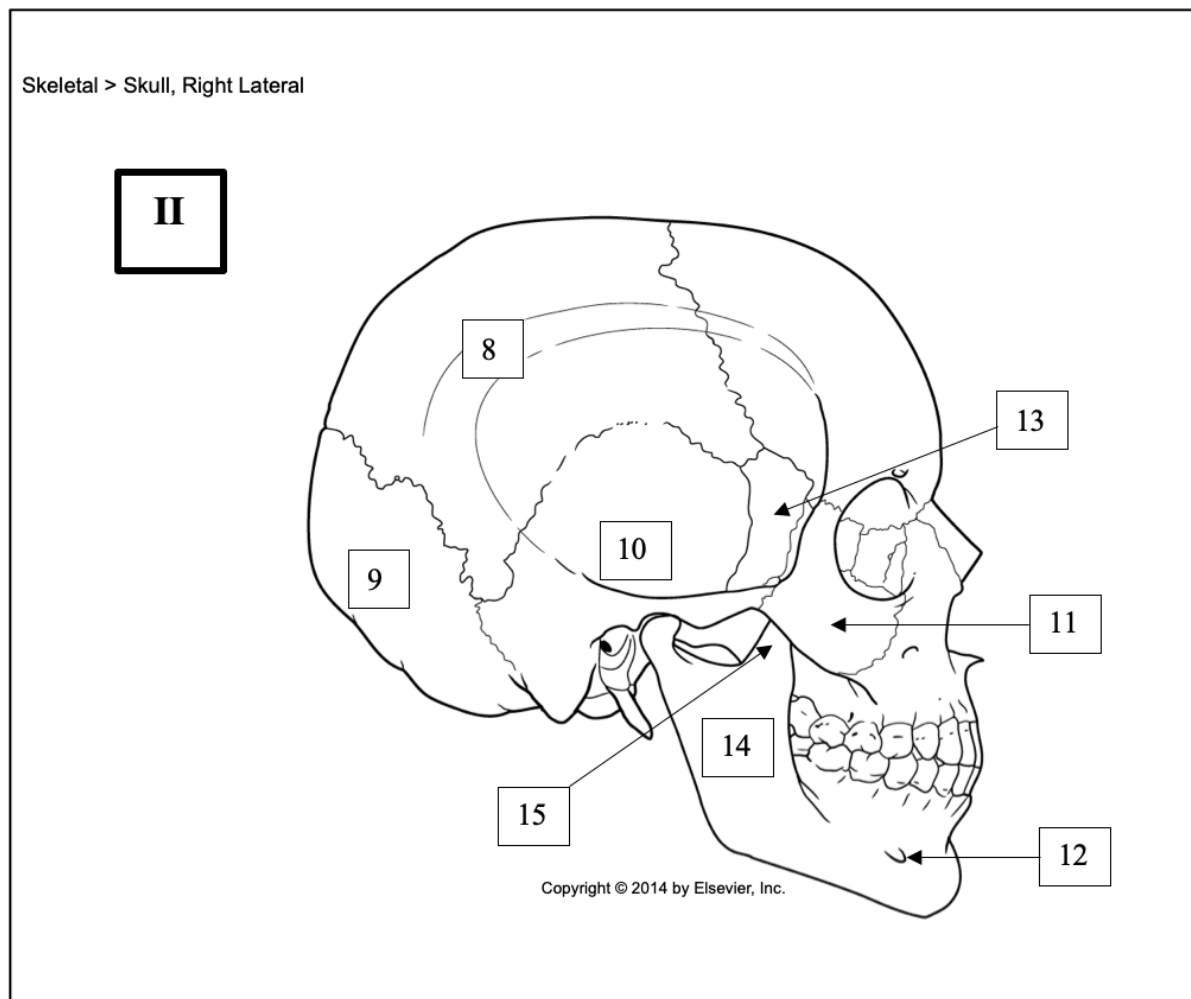


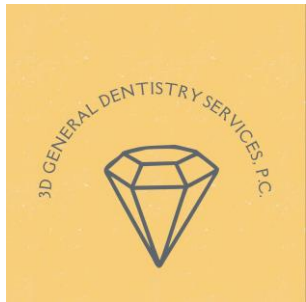
TMJ Anatomy (TemporoMandibular Joint)

Alabama Dental Hygiene Program

Illustrated Anatomy of the Head and Neck, 6th Edition Margaret J. Fehrenbach and Susan W. Herring

- 8. Parietal
- 9. Occipital
- 10. Temporal
- 11. Zygoma
- 13. Sphenoid
- 14. Mandible
- 15. Coronoid Process





TMJ Anatomy (TemporoMandibular Joint)

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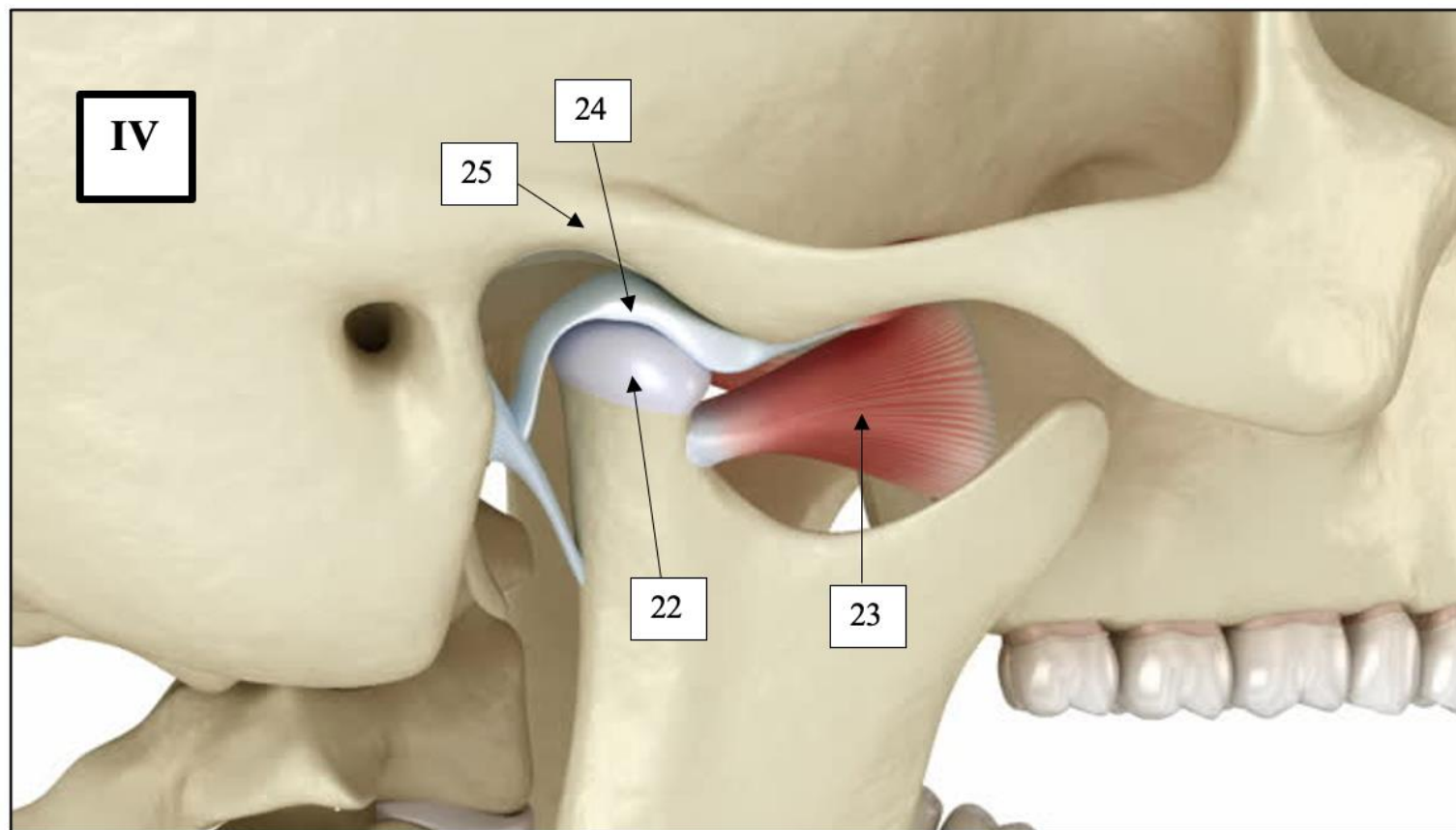
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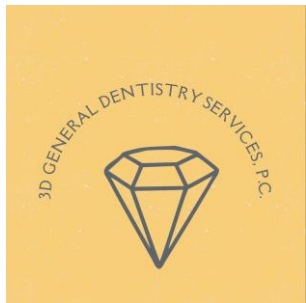
22. Condyle

23. Lateral Pterygoid

24. Articular Disc

25. Articular Eminence of Temporal bone





TMJ Anatomy

(TemporoMandibular Joint)

Alabama Dental
Hygiene Program

Dr. Hussein Basma pdf

- **Temporalis:**

O = temporal fossa (temple)

I = coronoid process (and the mandible posterior to third molars) F = retract and elevate the mandible

- **Masseter:**

O = zygomatic arch (cheekbone)

I = outer surface of the mandible (and angle of the mandible) F = elevate the mandible

- **Medial Pterygoid:**

O = medial surface of the lateral pterygoid plate (sphenoid bone)

- and maxillary tuberosity

I = inner surface of the angle of the mandible F = elevate and protrude the mandible

- **Lateral Pterygoid:**

O = lateral surface of the lateral pterygoid plate (sphenoid bone)

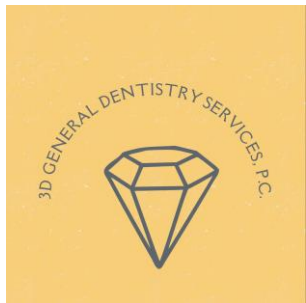
- and infratemporal surface of the sphenoid bone

I = TMJ disc and neck of the mandibular condyle

F = protrude and/or depress the mandible (working with the

- **hyoid muscles**), and allow the side to side (lateral) shift of the mandible



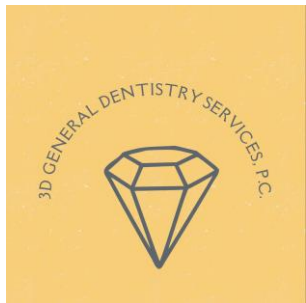


TMJ and Bruxism Diagnostic Tools

Garstka AA, Kozowska L, Kijak K, Brzózka M, Gronwald H, Skomro P, Lietz-Kijak D.

Accurate Diagnosis and Treatment of Painful Temporomandibular Disorders: A Literature Review Supplemented by Own Clinical Experience. Pain Res Manag. 2023 Jan 31;2023:1002235. doi: 10.1155/2023/1002235. PMID: 36760766; PMCID: PMC9904928

- "An accurate diagnosis of TMD is the foundation of appropriate treatment."
- "TMD Pain Diagnosis
 - Myalgia
 - Myofascial Pain
 - Arthralgia
 - TMD-Attributed Headache
 - Disc Displacement
 - Osteoarthritis
 - Subluxation"



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Myalgia “(muscle pain) can be caused by mandibular movements, parafunctions, and excessive muscle tension.”

Myofascial Pain “pain spreads beyond the palpated area.”

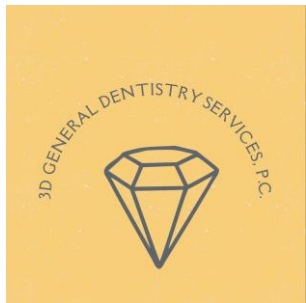
Arthralgia “pain in the temporomandibular joint without signs of joint inflammation..”

TMD-Attributed Headache “history of temporal pain of any nature..”

Disc Displacement “An intracapsular disorder involving the condyle disc complex.”

Osteoarthritis “involves joint tissue deterioration with concomitant osseous changes in the condylar head and/or articular eminence..”

Subluxation “hypermobility disorder involving the disc-condyle complex and the articular eminence.”

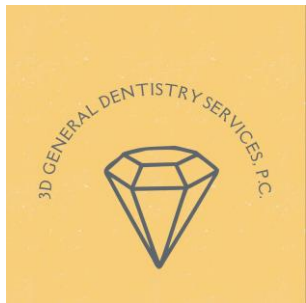


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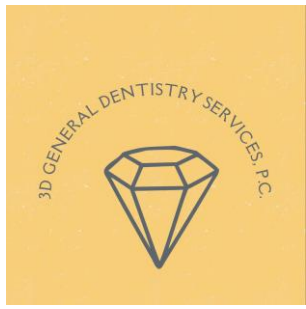
- "The most commonly described treatments include
physiotherapy
occlusal splint therapy
pharmacological treatment..."
- "Michigan-type relaxation splint with canine guidance is used in cases involving: myalgia, myofascial pain, and TMD-attributed headache...always applied to a single arch."



TMJ and Bruxism Diagnostic Tools

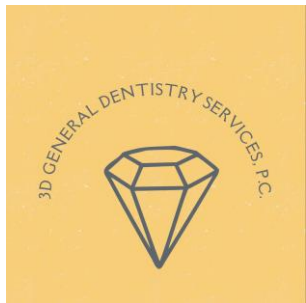
Dr. Goodspeed's
Home TMJ Therapy

- Soft diet
- Ice/heat/ice (5-10 minutes each) prn
- 400-600 lb qid



TMJ and Bruxism Diagnostic Tools

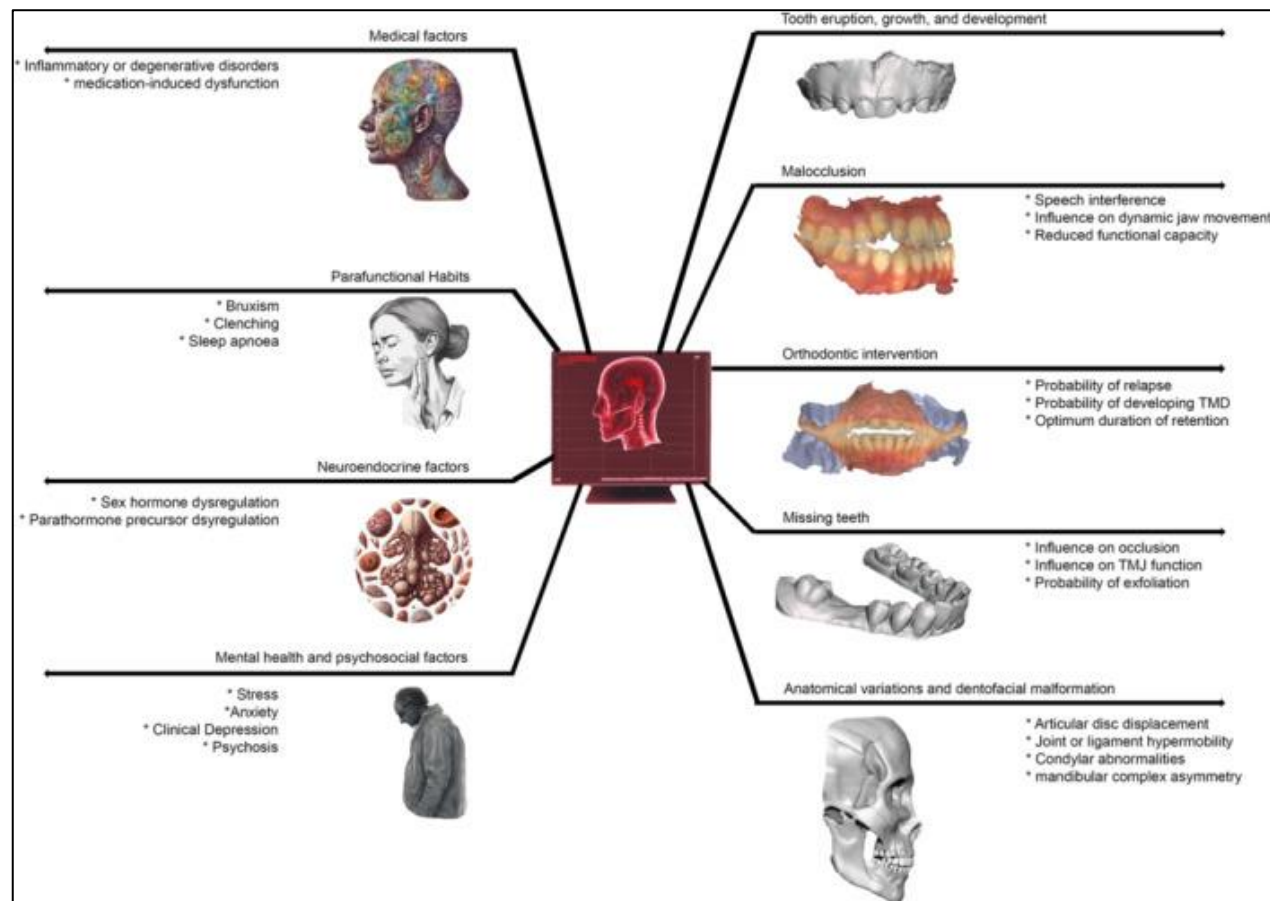
Farook TH, Dudley J. Understanding Occlusion and Temporomandibular Joint Function Using Deep Learning and Predictive Modeling. Clin Exp Dent Res. 2024 Dec;10(6):e70028. doi: 10.1002/cre2.70028. PMID: 39563180; PMCID: PMC11576518.



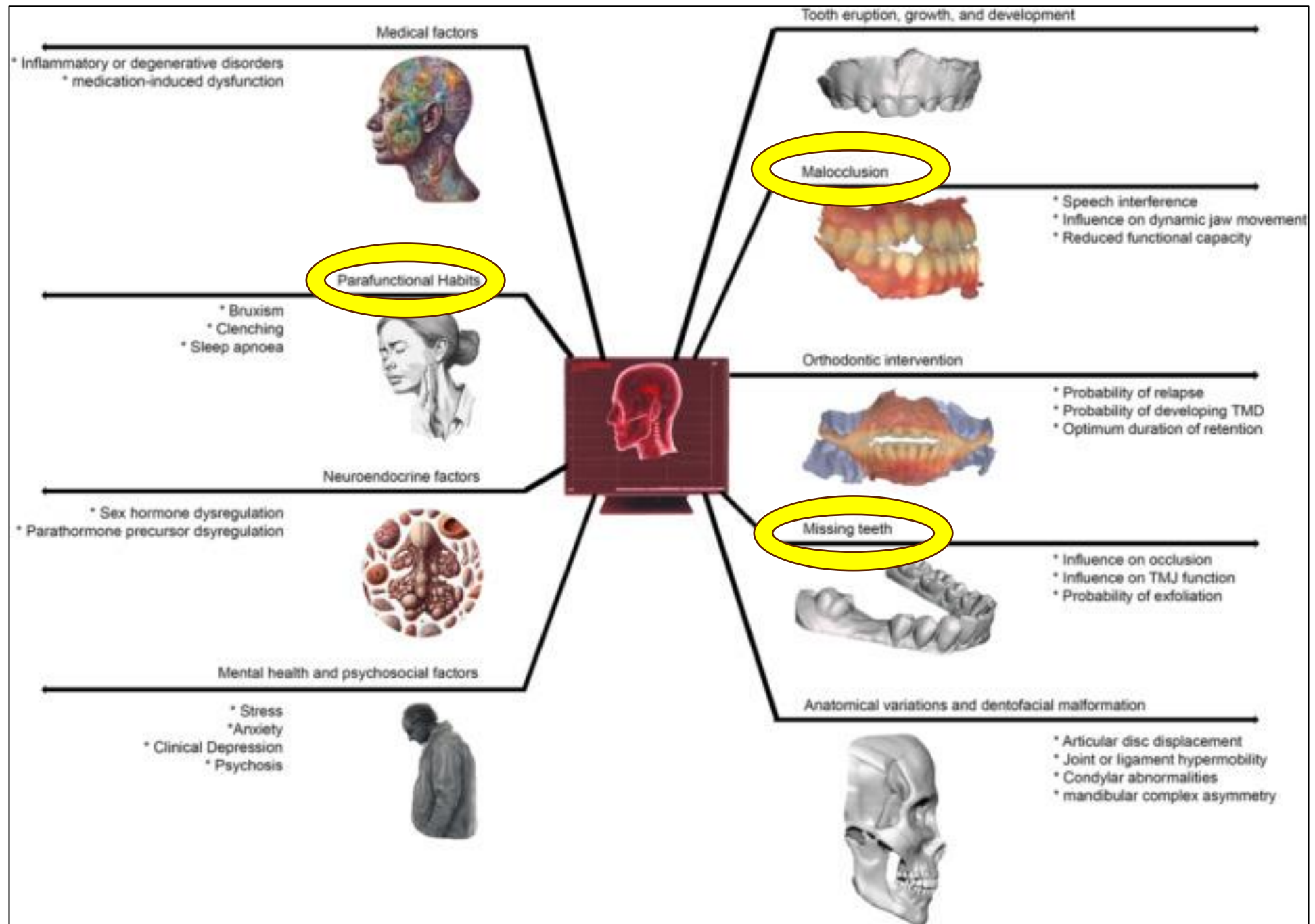
TMJ and Bruxism Diagnostic Tools

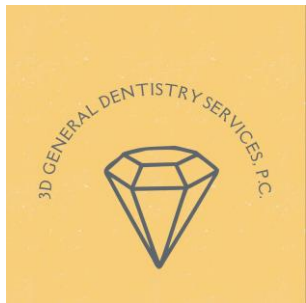
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[TMD] “predictions enabled by dental data... in combination with a comprehensive medical history and investigation reports.”



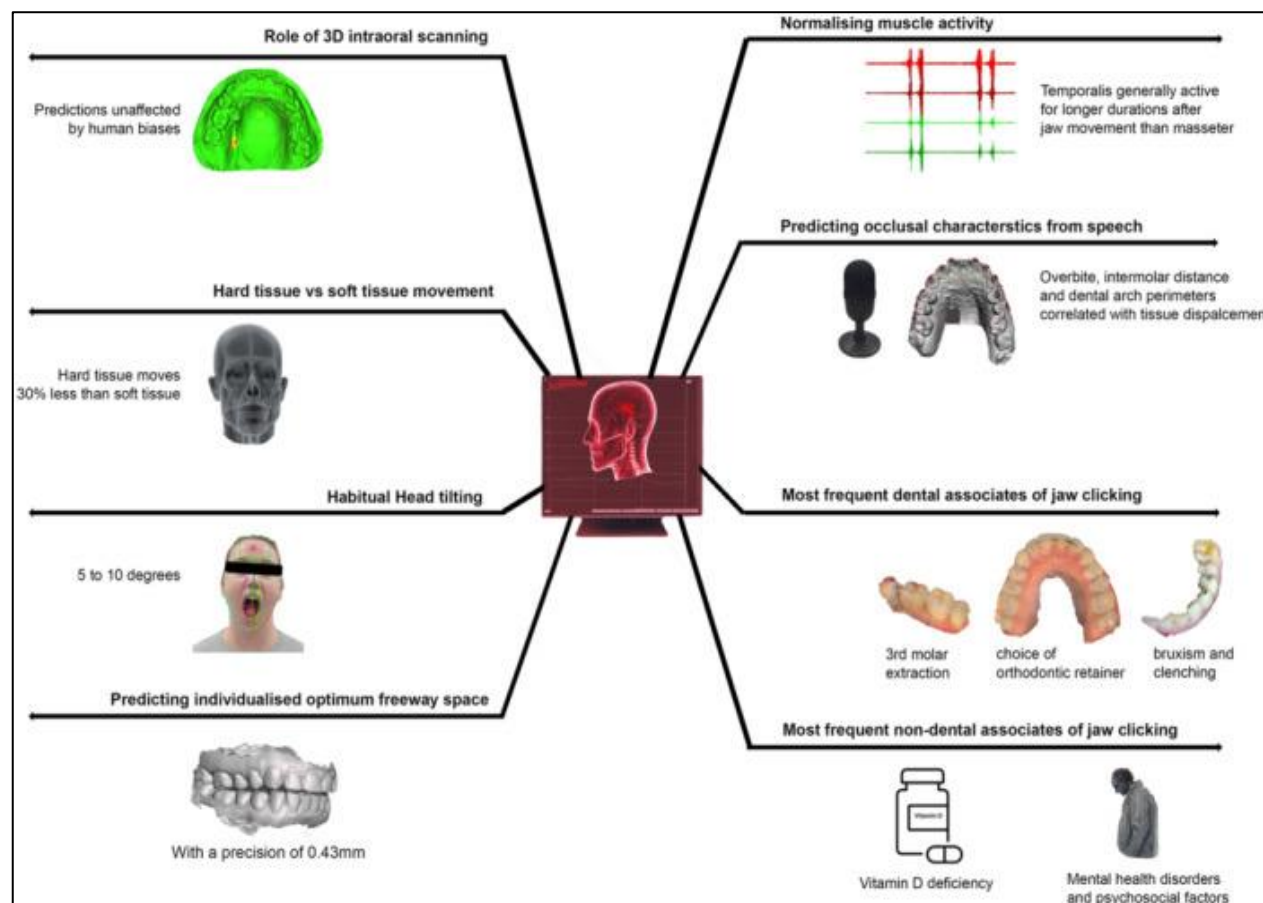
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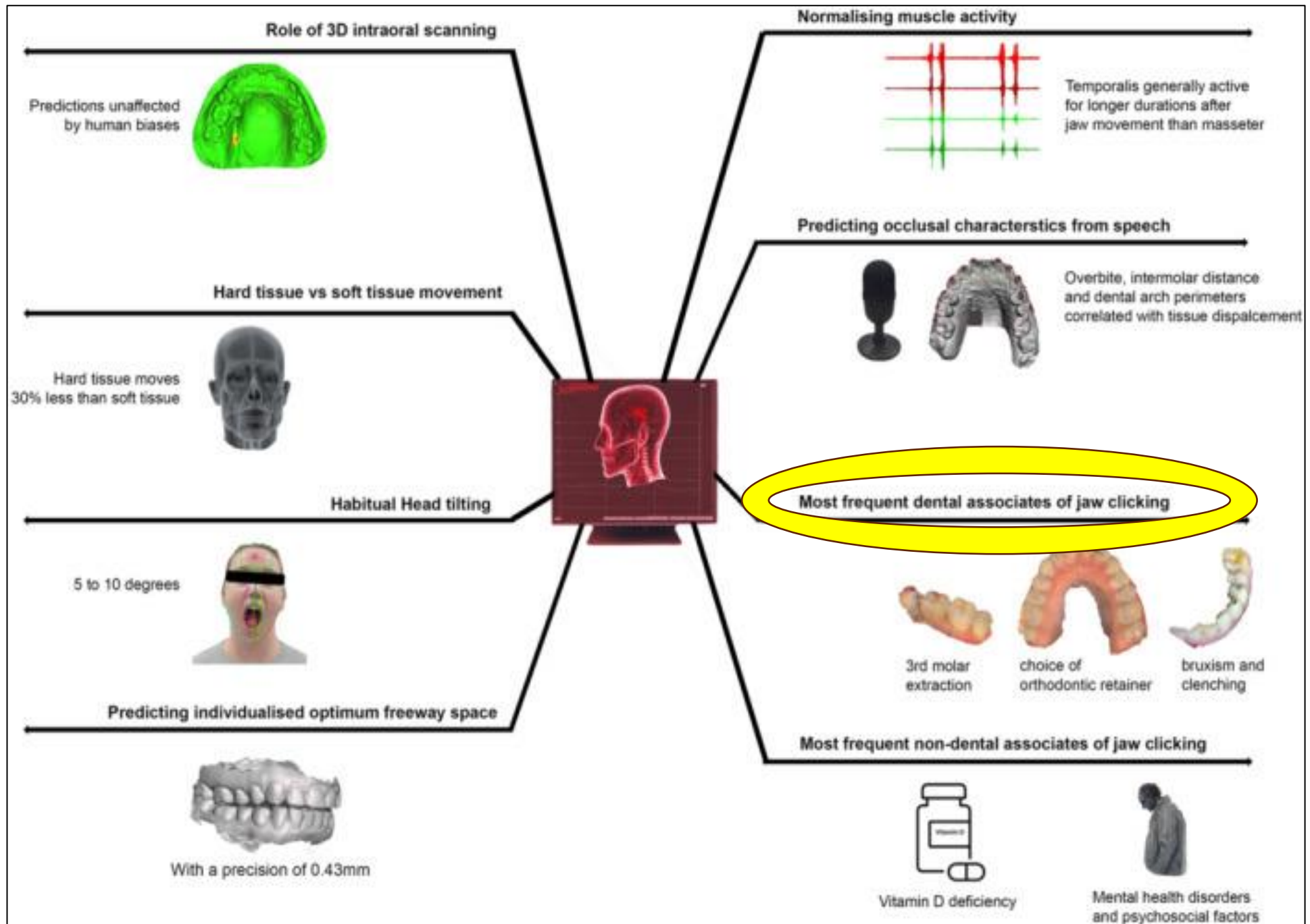


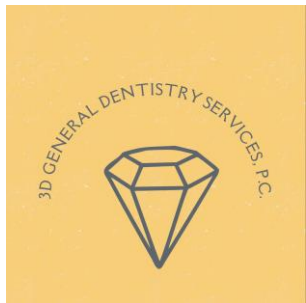


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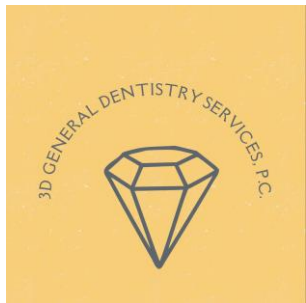
TMJ and Bruxism Diagnostic Tools

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' "Do malocclusion, tooth loss, and bruxism contribute to temporomandibular disorders?"

- "it was observed that the occurrence and attributes of TMD are influenced by the number of tooth loss quadrants and the frequency of missing teeth."
- "a correlation was found between bruxism and the symptoms of TMD, including myofascial pain, disc displacement, arthralgia, and muscle disorders."
- "This [study] prompts healthcare professionals to prioritize patients' occlusal assessment and TMJ condition."

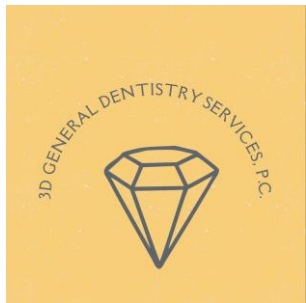


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- "bruxism was present in a quarter of the elderly population..."
- "The findings suggested that bruxers are more likely to be diagnosed with myofascial pain..."
- "Muscle disorders and DD were more frequent in individuals with bruxism."



TMJ and Bruxism Diagnostic Tools

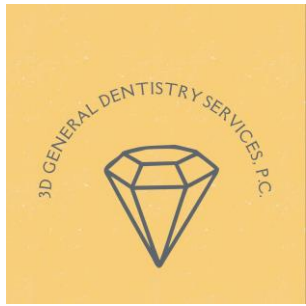
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- "While some authors have found a strong association between TMD and occlusal factors, such as malocclusions, bruxism, or dental loss, others have reported a weak or no link between these conditions."

Dr. Barry Goodspeed's clinical experience:

I found predictable success in treating TMJ symptoms when obvious occlusal discrepancies and inadequacies were present!



TMJ and Bruxism Diagnostic Tools

Dr. Goodspeed's Esthetic and Orthodontic Exam modified from original document from Invisalign Orthodontic Quick

Orthodontic/Esthetic Consultation Sheet
3D General Dentistry Services, PC

Patient Name		Date:	Phone #:
Email		Age/DOB	
Chief Concern(s):			
Doctor Concerns:			
Other			

Occlusion		Midline	MAXILLARY	MANDIBULAR
Class		Crowding		
CR CO		Spacing		
Over Bite		Crossbite		
Over Jet		Cant		
Perio Stage, Grade		Rotations		
TMJ		Whitening		
Lateral Canthi Distance		Incisal Display	Tooth #(mm):	
Other		H x W Central		
		Restorative		

TREATMENT			
Pre Ortho:			
SureSmile	Invisalign	ClearCorrect	Refer
Full Case	Anterior	Express	
Time Estimate		Fee Estimate	
NEXT VISIT	Comp Exam	Perio Exam	Px
Ortho Records:	IO Scan	CBCT Panx FMX	
Photographic Records:	Photo Set 8 up	3:1 (Smile, Retracted, Lips at Rest)	

Reviewed: Initial, Date	IPR	To create space, teeth may need to be slenderized.
	Attachments	Tooth colored bonding may be placed on teeth to move selected teeth more readily.
	OA	Teeth may need to be adjusted before, during, &/or after treatment to make bite line up just right.
	Retainers	Will need to be worn indefinitely when treatment is completed to prevent relapse and to protect your investment.
	Refinement	At end of initial treatment Dr. or patient may request an additional set of trays to obtain a more optimum result; We often see about 90% of anticipated/programmed result.
	22 hrs/Day	Trays must be worn 22 hours (all the time except eating then brushing and flossing teeth) every day for treatment to be successful. Only water can be consumed with trays in place.

Orthodontic/Esthetic Consultation Sheet
3D General Dentistry Services, PC

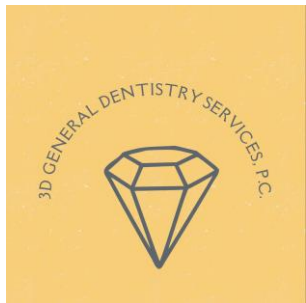
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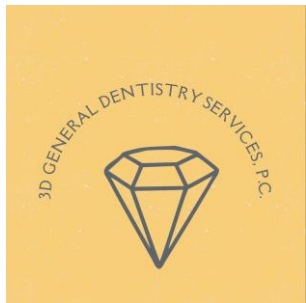
Splint Records

Three separate catalogs or scans needed:

Upper jaw with detail of all surfaces plus @ **3 mm gingiva**;
(@ **6mm** of palate for maxillary splint; **6mm** of mandibular
lingual gingiva for mandibular splint).

Lower jaw,

CR Bite record opened @ **1-2mm** at posterior taken with leaf
gauge, bite stick, or other repeatable method.

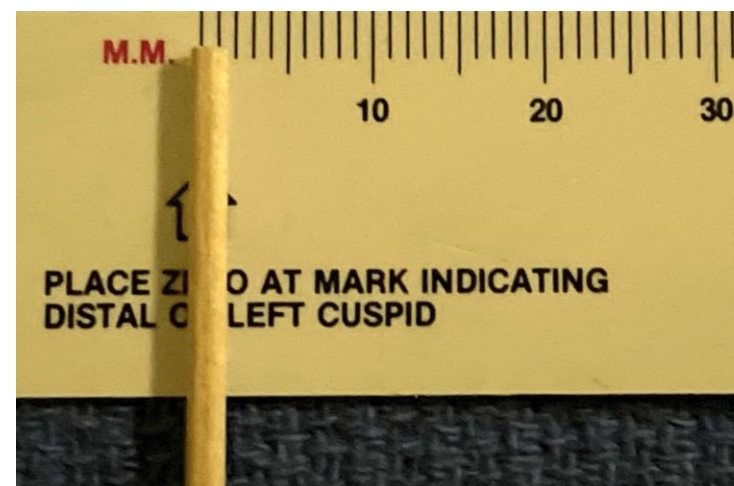


Splint Records

- Leaf Gauge
(Spear education)



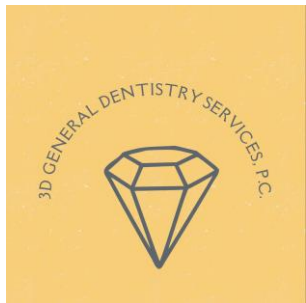
- Bite Stick 1-2mm Clearance at distal Molars
(depending on material requirements)





Splint Records





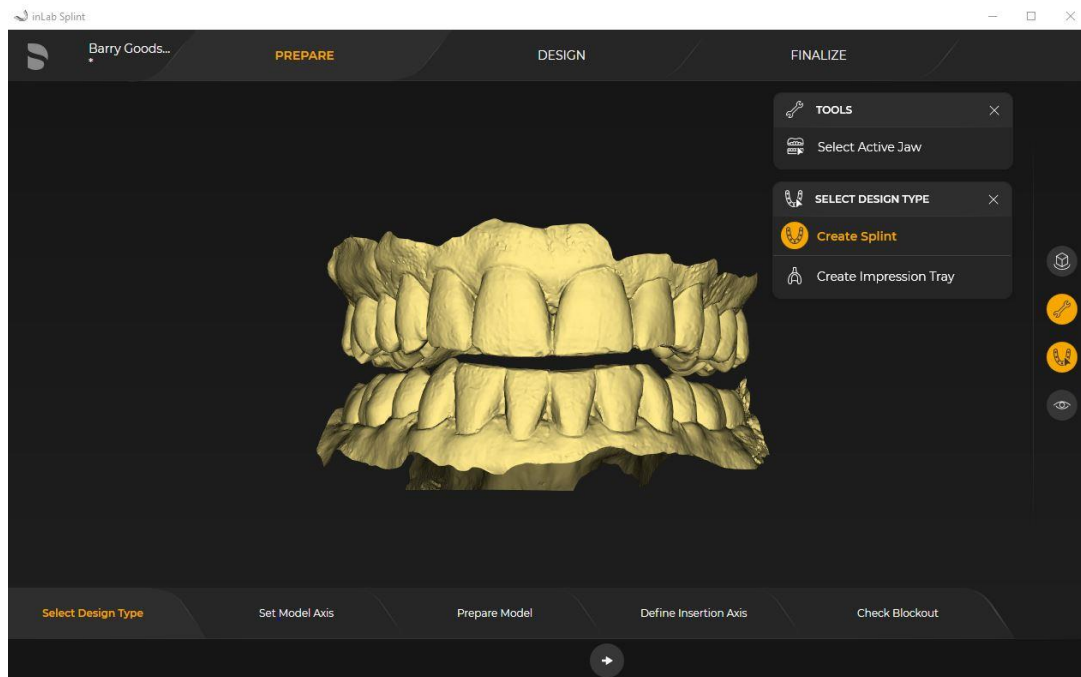
Splint Records



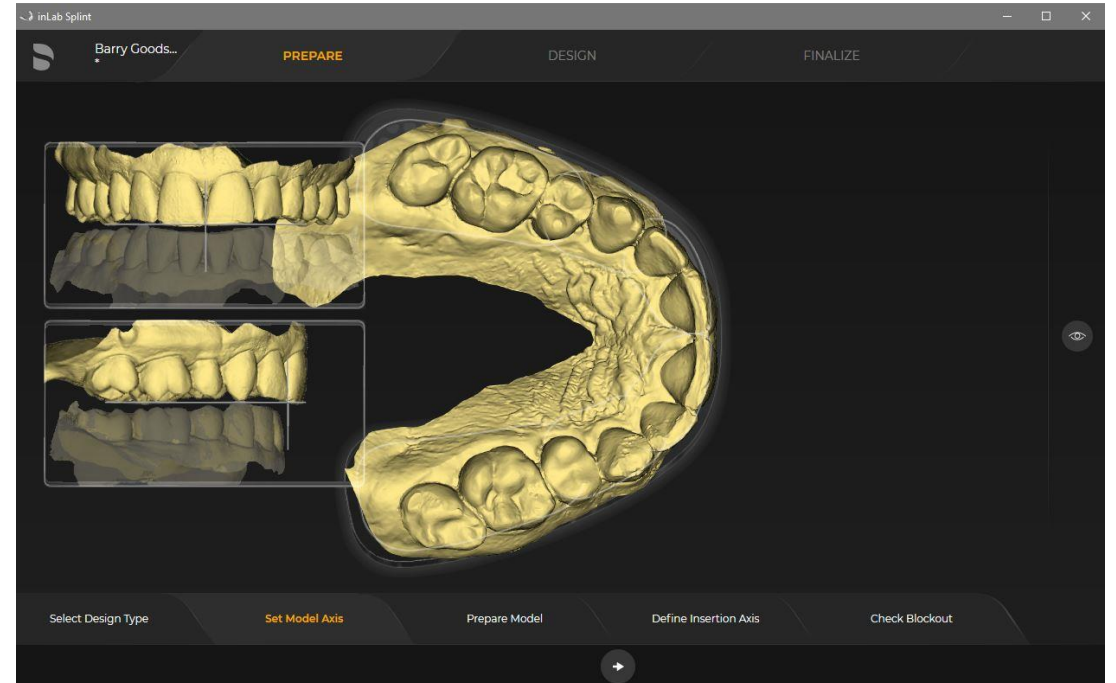


inLab 22 Splint Module Workflow

Select Jaw, Splint or Tray

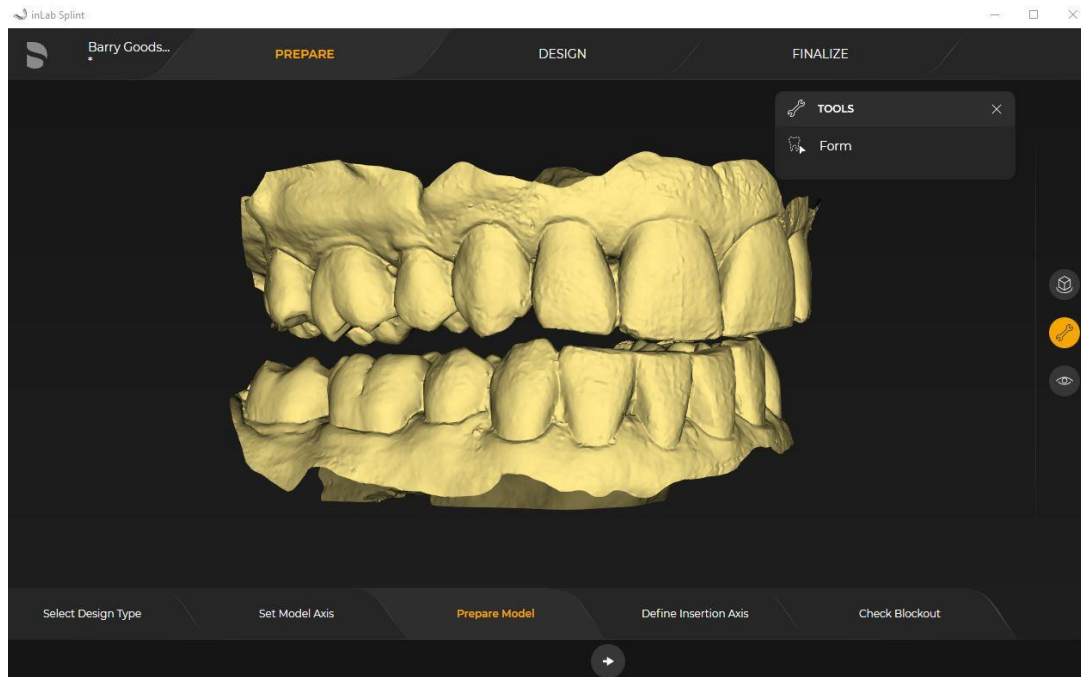


Model Axis

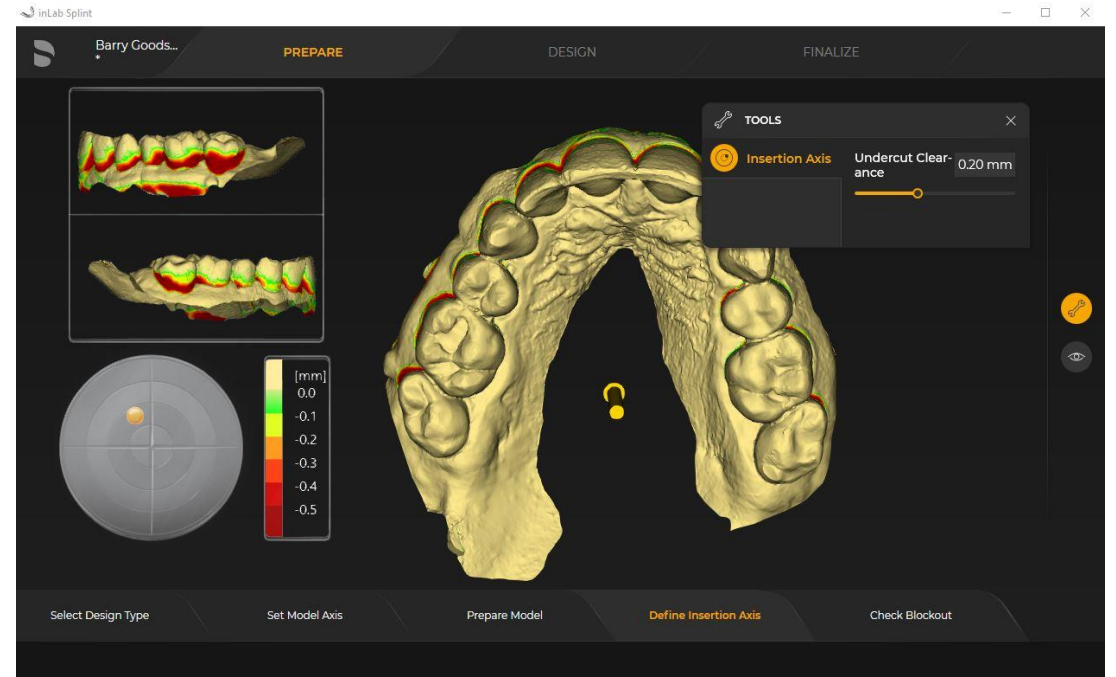


inLab 22 Splint Module Workflow

Amend Model PRN

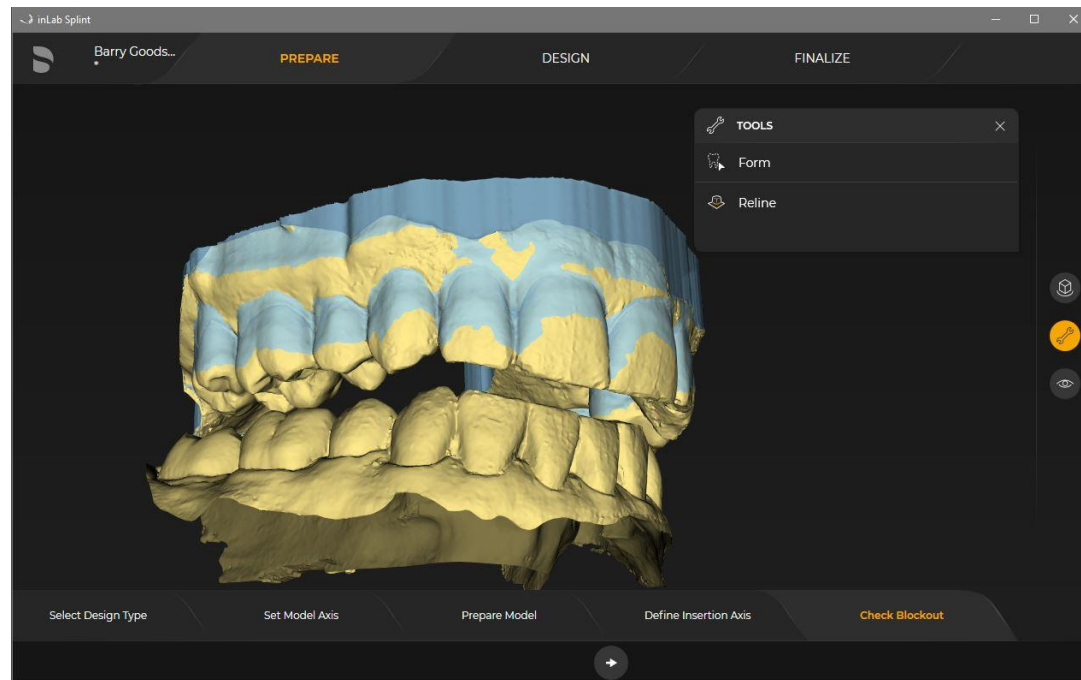


Insertion Axis

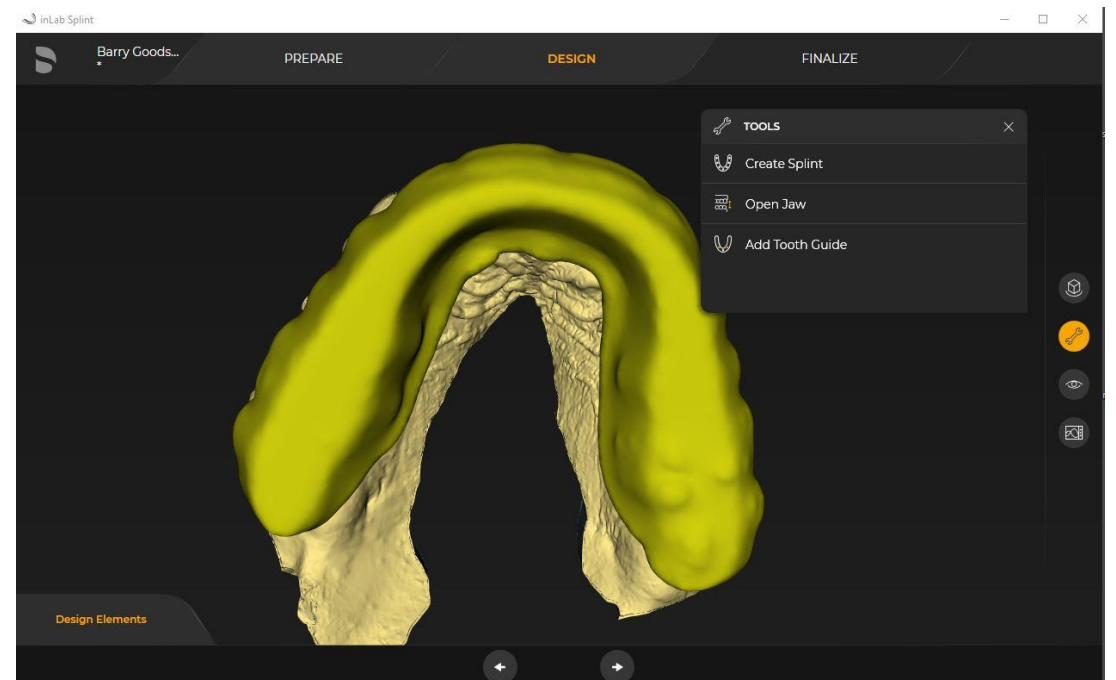


inLab 22 Splint Module Workflow

Block out. Height of Contour

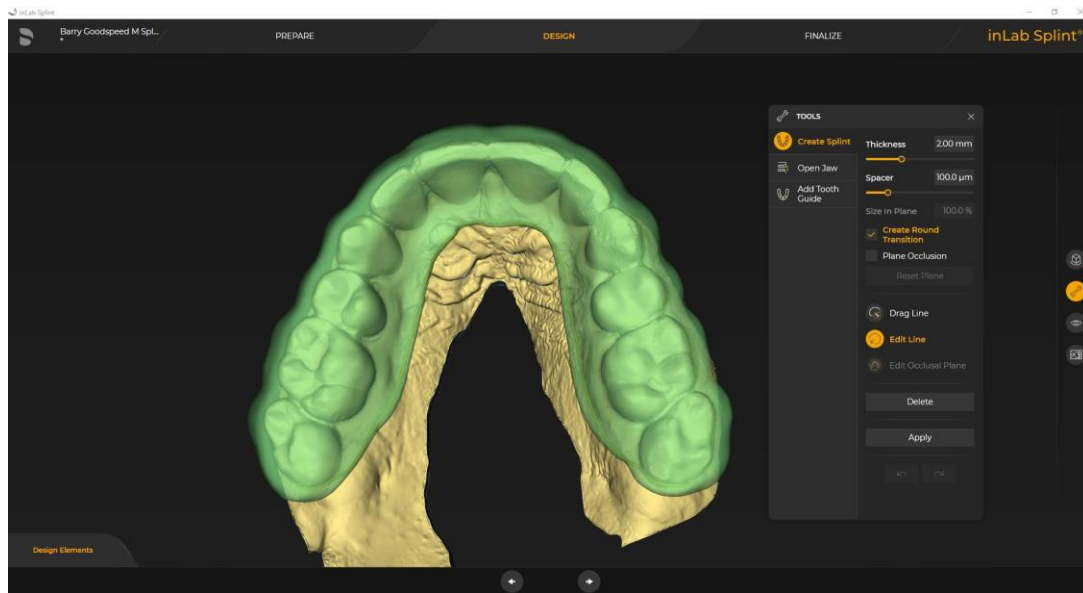


Create Splint



inLab 22 Splint Module Workflow

Spacer and Thickness

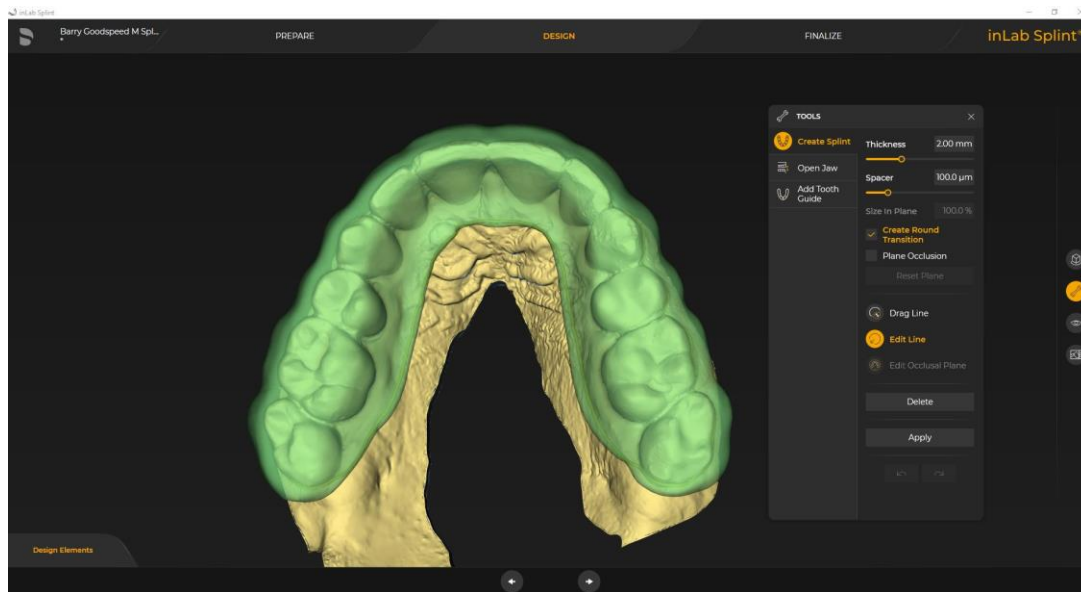


Primeprint Splint. 2 mm Thickness

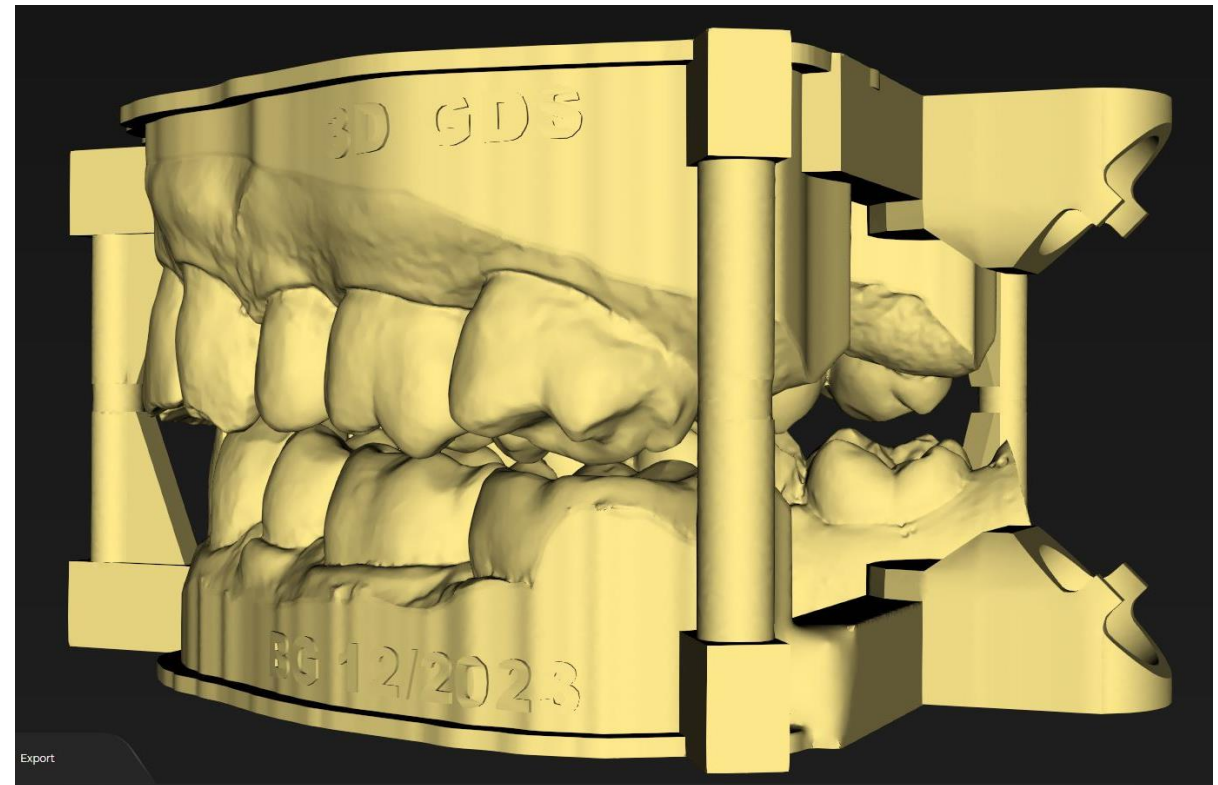


inLab 22 Splint Module Workflow

Spacer and Thickness

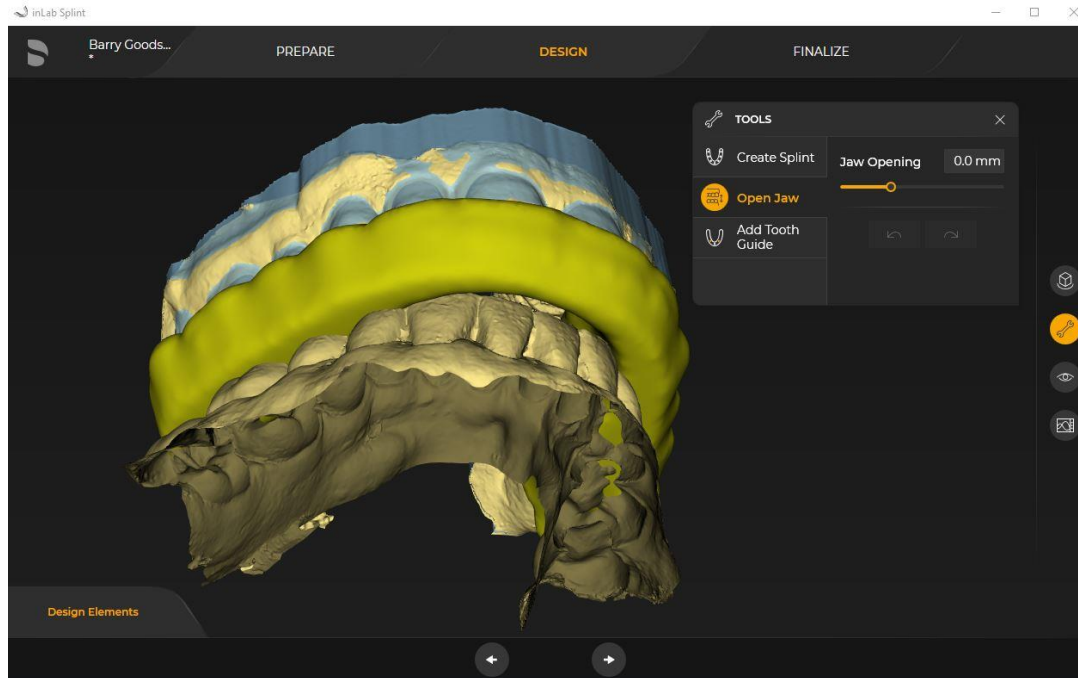


Primeprint Splint ST: 0.8 mm Thickness

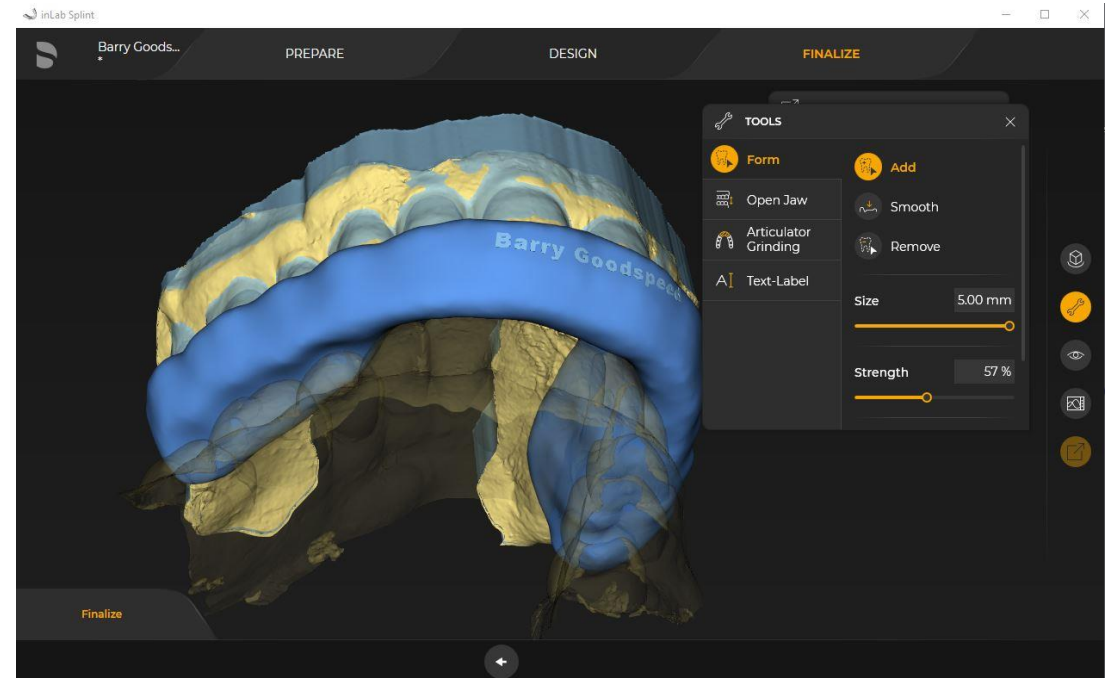


inLab 22 Splint Module Workflow

Open VDO if more clearance needed



Protrusive + Lateral Ramps are digitally/manually formed

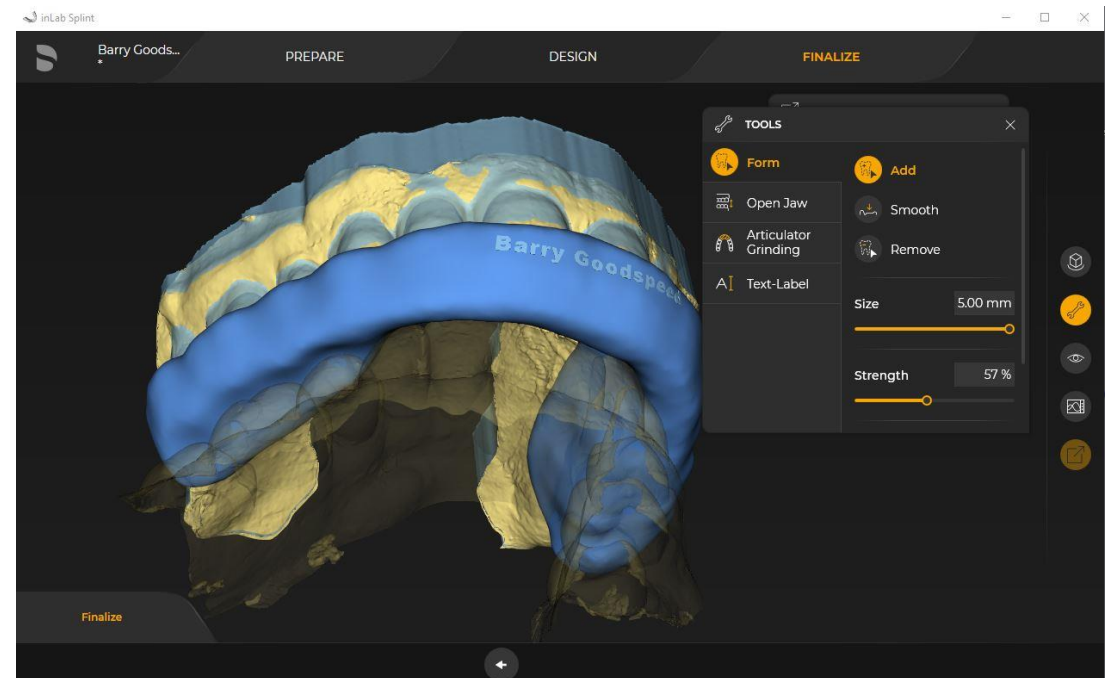


inLab 22 Splint Module Workflow

Measure Protrusive Extent to Estimate Anterior Ramp Width?

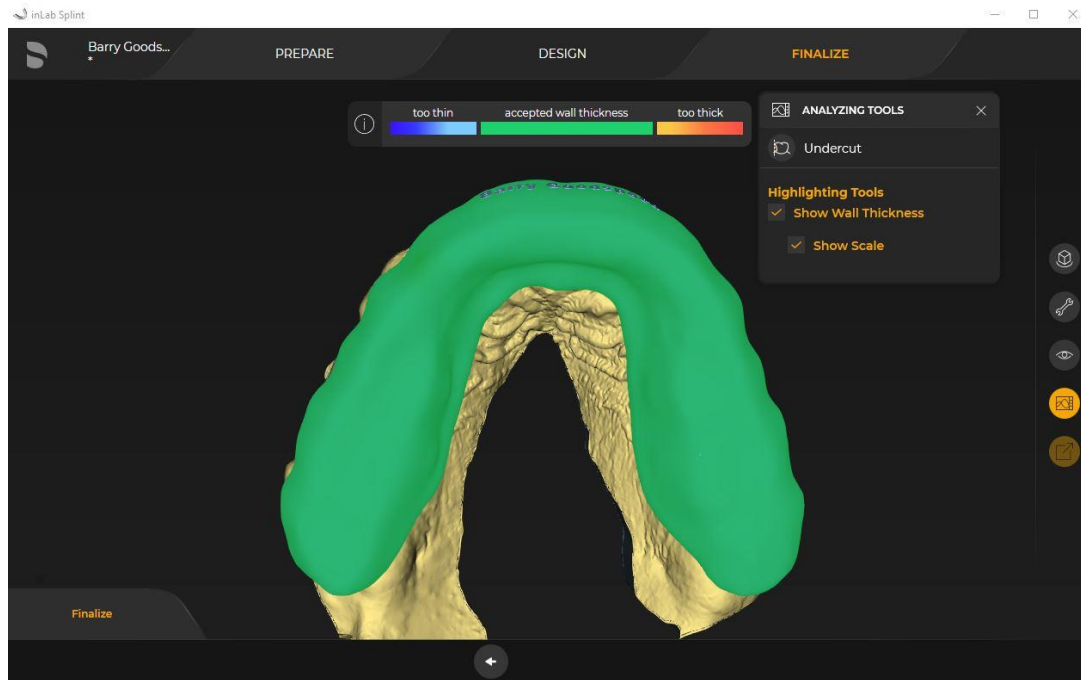


Protrusive + Lateral Ramps are digitally/manually formed

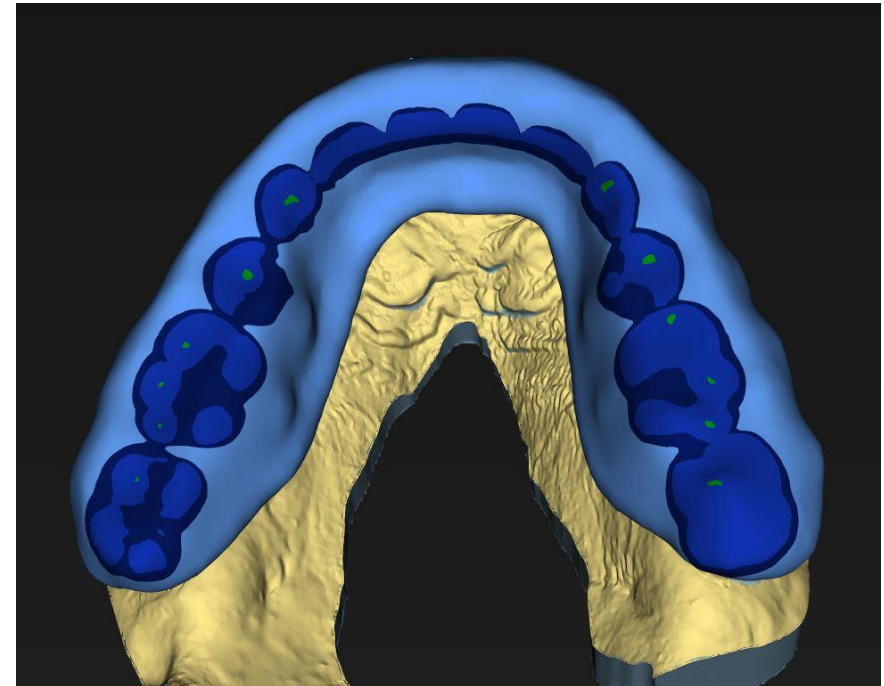


inLab 22 Splint Module Workflow

Check for Proper 2 mm Thickness

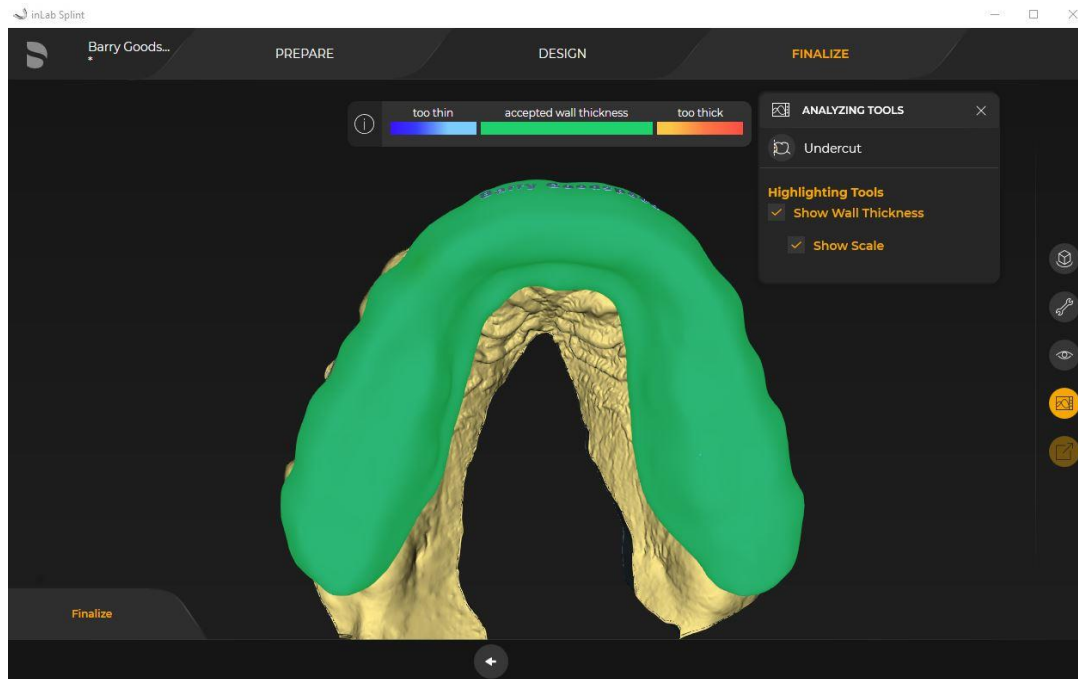


Occlusion Contacts. Dialed In

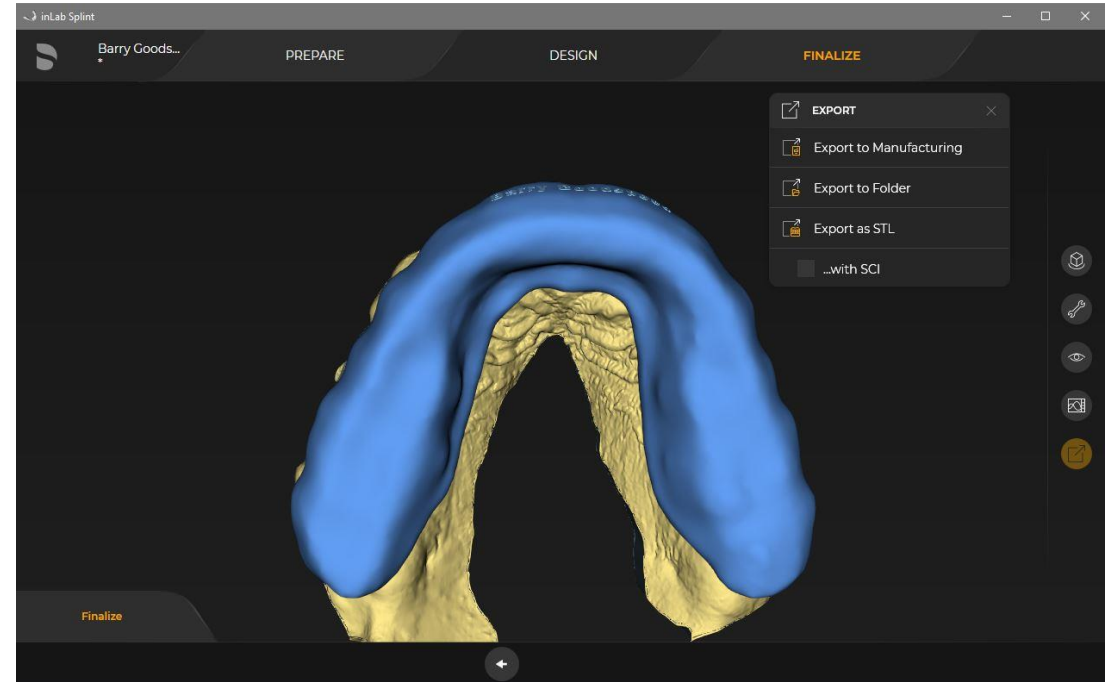


inLab 22 Splint Module Workflow

Check for Proper 2 mm Thickness



Export



inLab 22 Splint Module Workflow

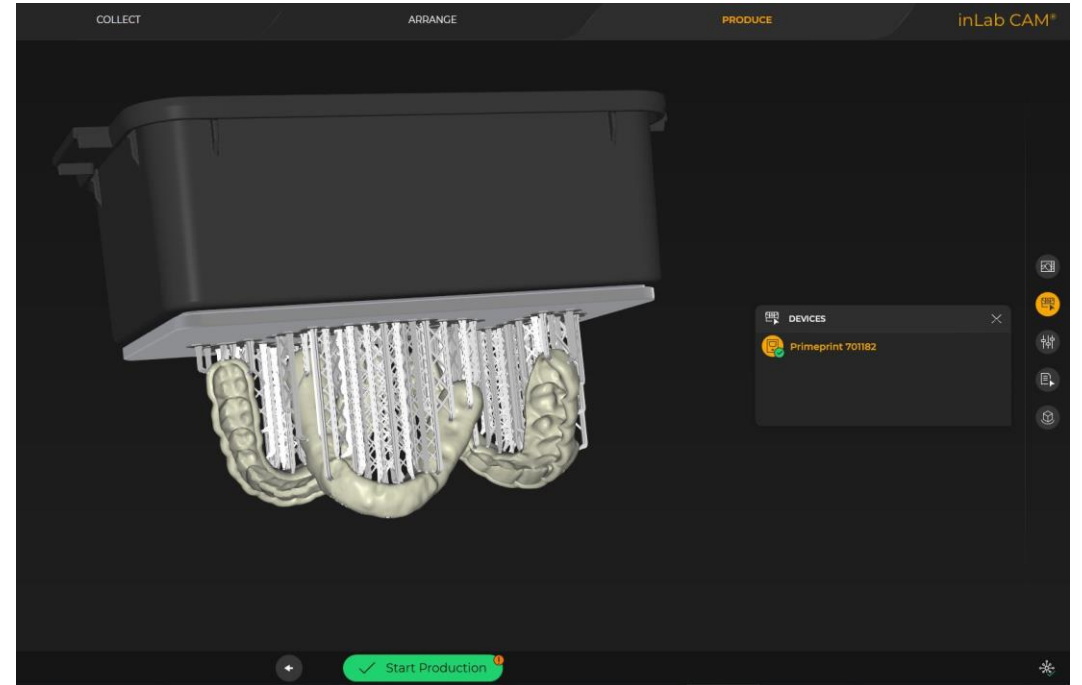
PrimePrint & PPU

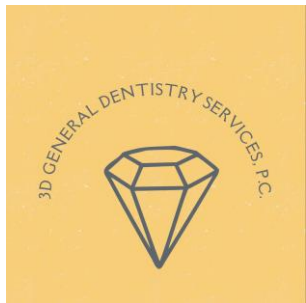


[Primeprint Solution Hardware Tutorials Chairside and Labside \(en\)](#)

[Primeprint Solution Features at a glance \(en\)](#)

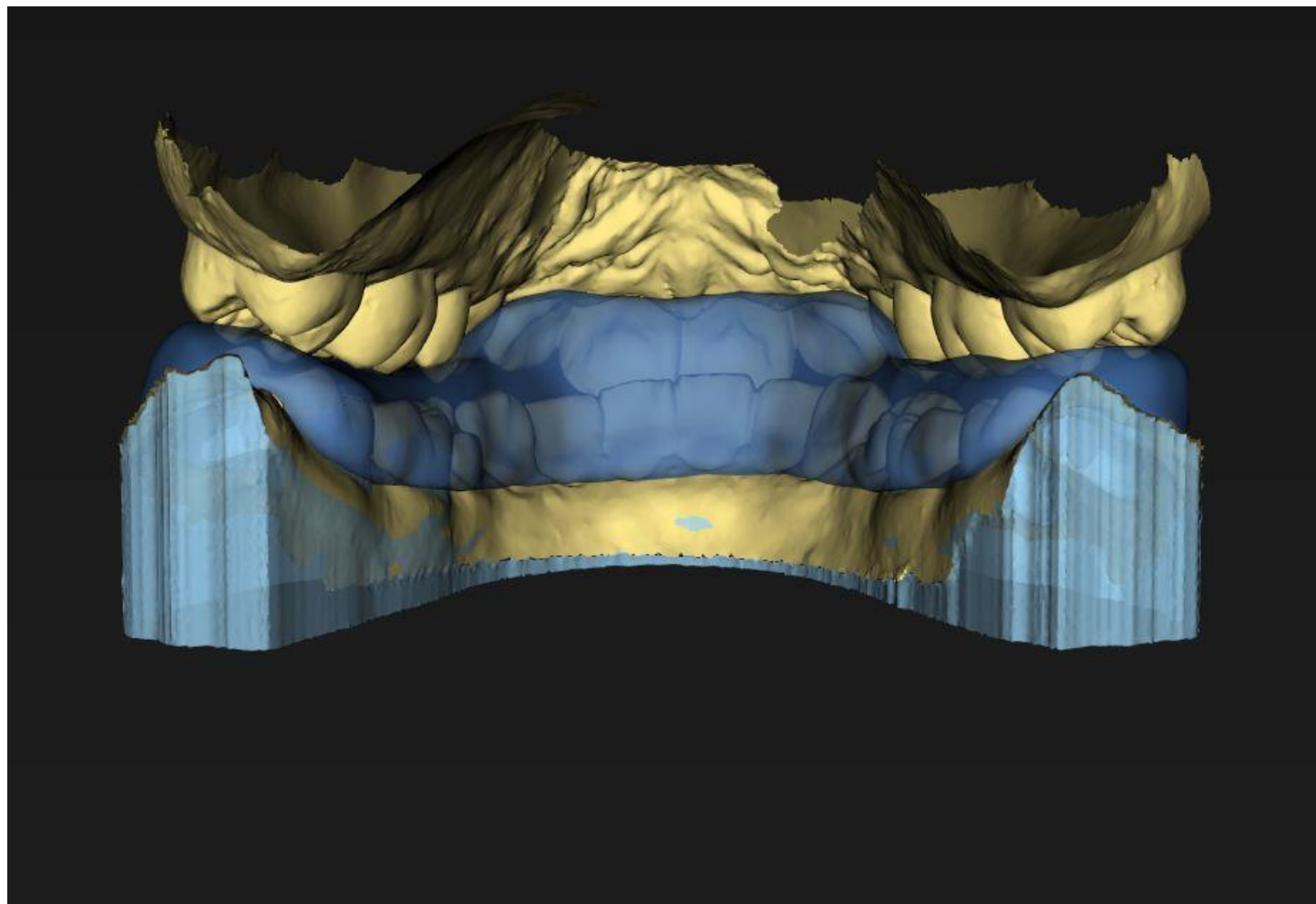
Printed Splints

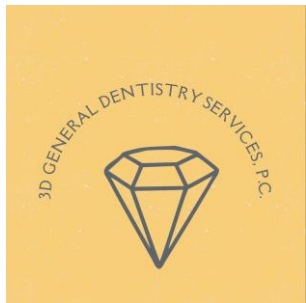




inLab Splints. Mandibular

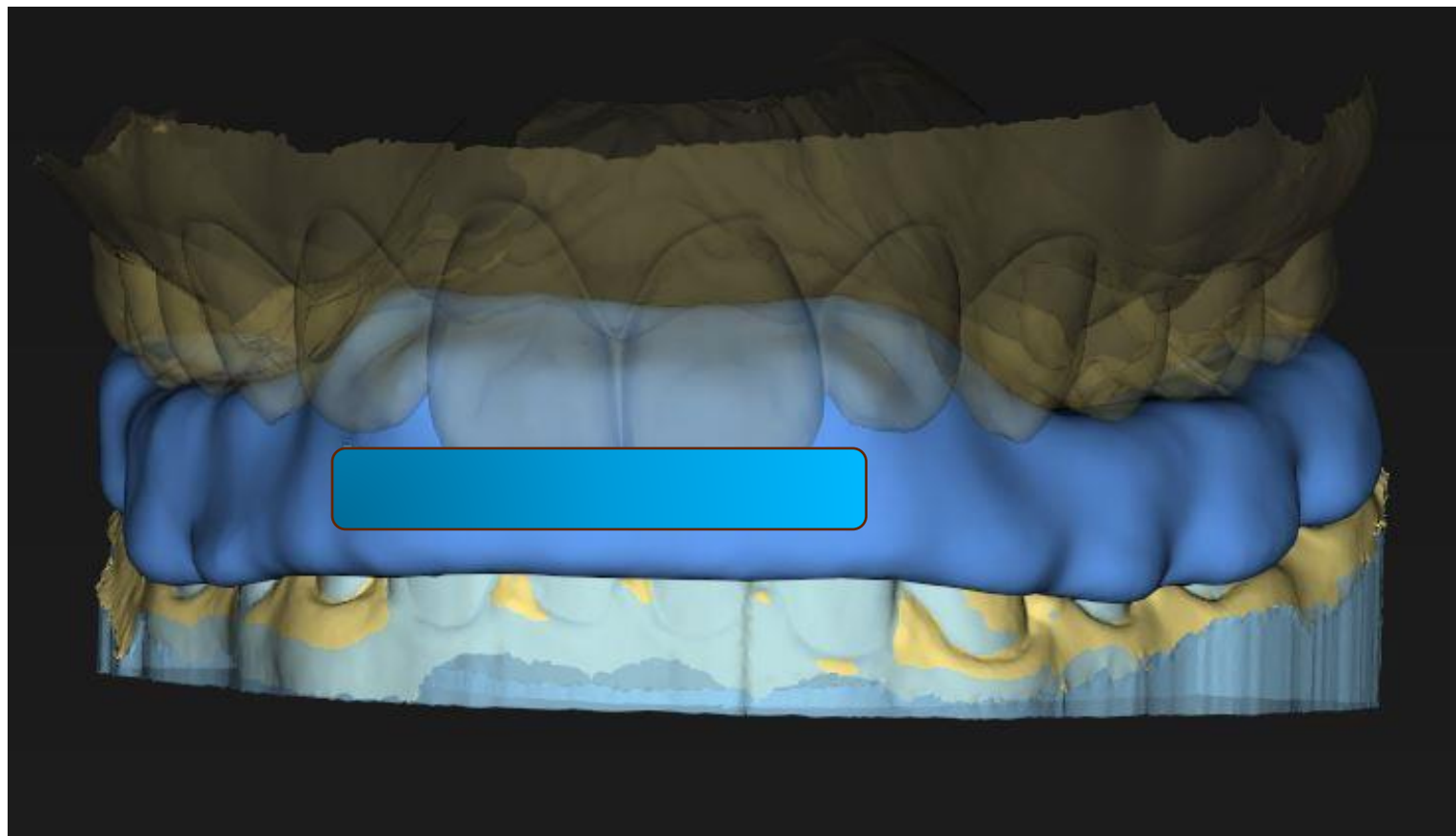
Mandibular Design



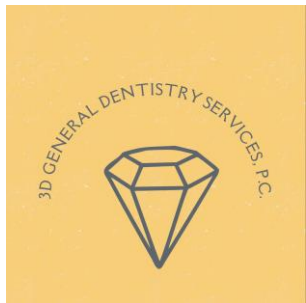


inLab Splints. Mandibular

Mandibular Design





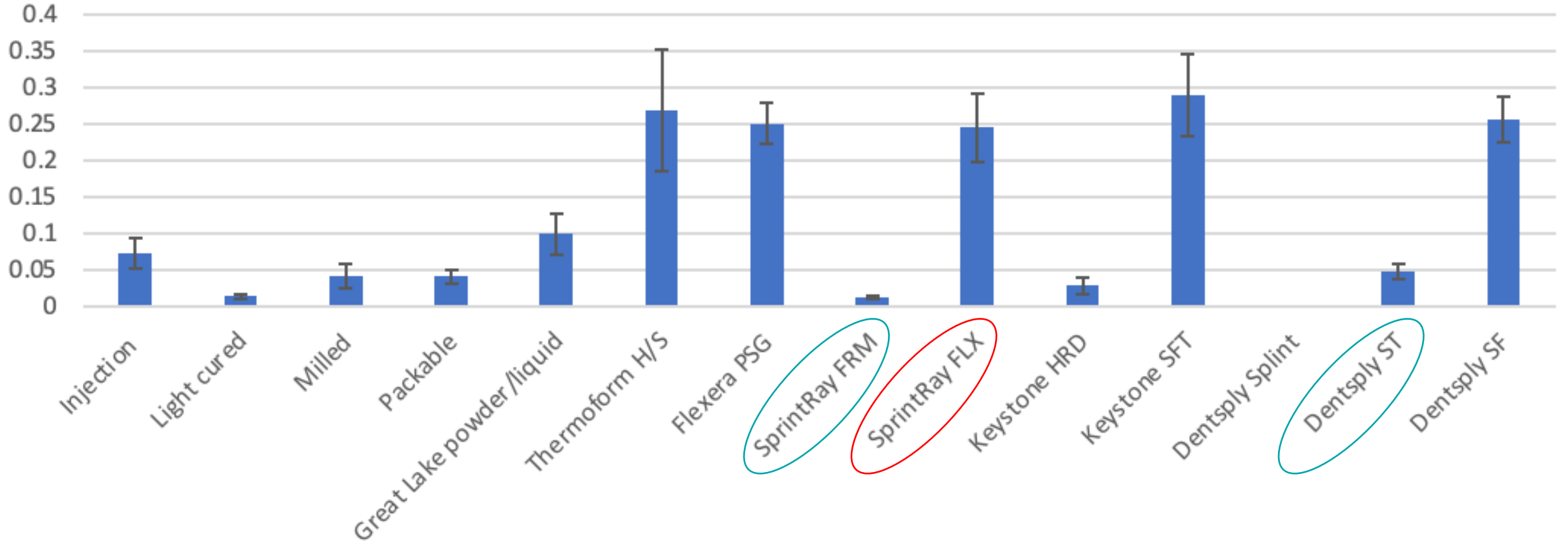


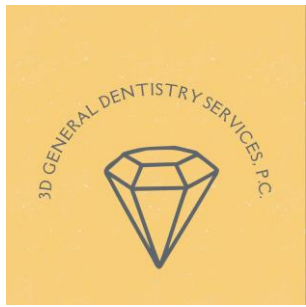
Splint Resins: Wear (preliminary results 2024)

Study and Results provided courtesy of **Nathaniel Lawson, DMD, PhD**

Associate Professor, Director Division of Biomaterials, UAB School of Dentistry

Wear



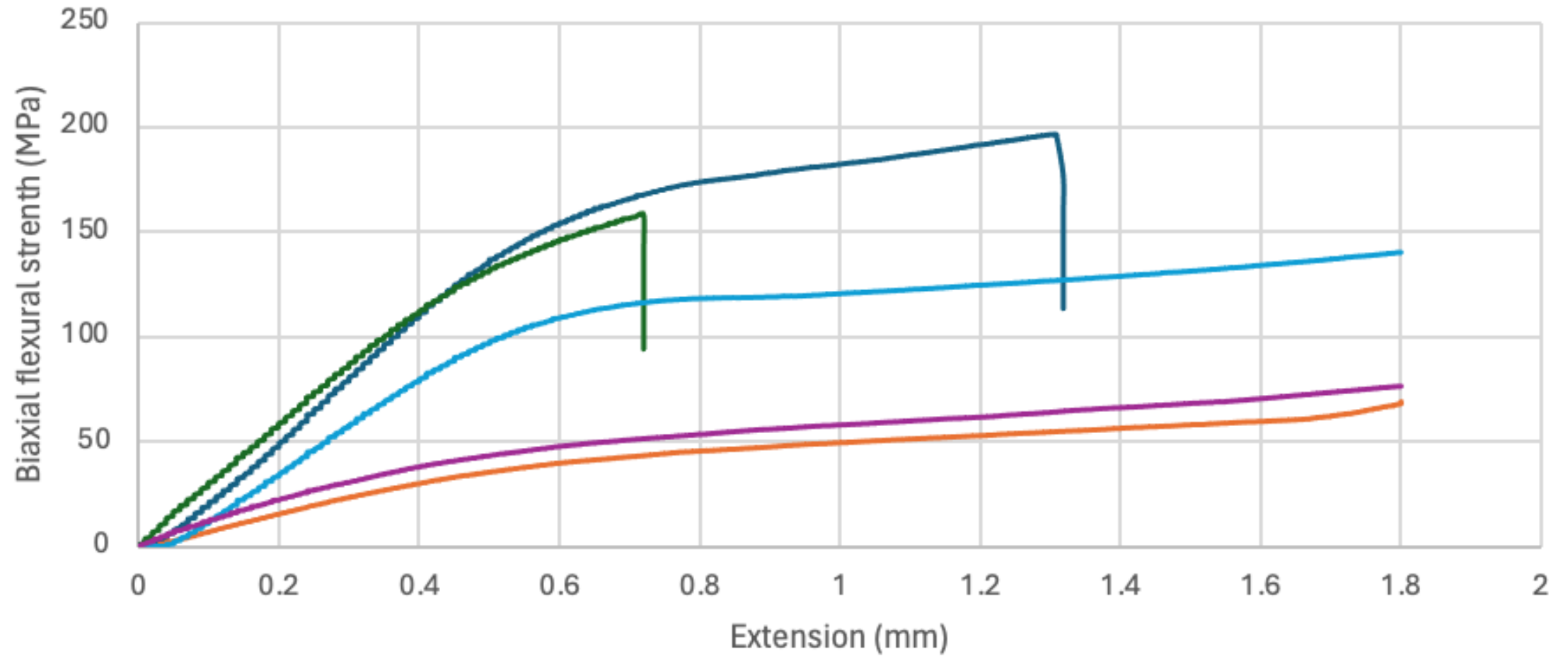


Splint Resins: Biaxial Flexural Strength

Study and Results provided courtesy of **Nathaniel Lawson, DMD, PhD**

Associate Professor, Director Division of Biomaterials, UAB School of Dentistry

Biaxial flexural strength (MPa)



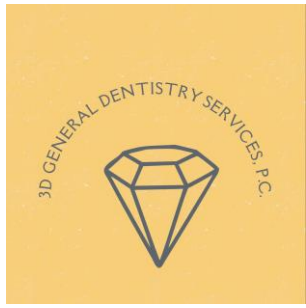
— Sprint Ray NG2 Firm

— Sprint Ray NG2 Flex

— PrimePrint Splint Resin

— PrimePrint Splint ST

— PrimePrint Splint SF



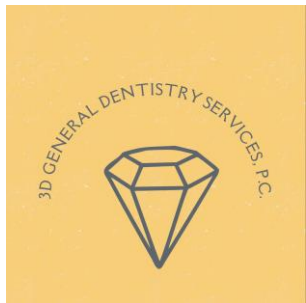
3D Printers Comparison

AGD Impact February 2024

Comparing Some of the Top 3D Dental Printers

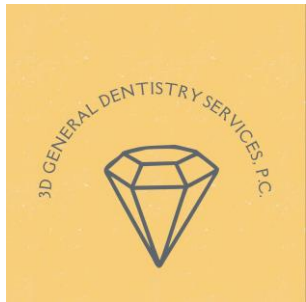
Printer	Pieces to system	Size of whole system	Design software required	Printer type	Layer thickness	Pixel size	Print surface size		Print speed	Cost before resins
Formlabs 3B+ 	Three	40.5 cm W × 37.5 cm D × 53 cm H Fast Cure: 27.5 cm W × 31 cm D × 31 cm H Form Wash: 26.2 cm W × 29.3 cm D × 34 cm H (64 cm when opened)	Preform (free), Blue Sky Bio (pay for file export)	Low force stereo-lithography (SLA)	25–300 µm	85 µm	14.5 cm W × 14.5 cm D × 18.5 cm H		Fast curing 5 minutes or less. Can print a single model in 20 minutes. Up to 60 models per working day.	\$10,500
Dentsply Sirona Primeprint 	Two	Printer: 53 cm W × 7 cm H × 51.5 cm D Post-processing unit: 73 cm W × 67 cm H × 51.5 cm D	InLab (included with purchase)	Digital light processing (DLP)	50 µm, 100 µm, 200 µm	70 µm	13.4 cm W × 15 cm H × 7.6 cm D		30–40 min for model on high-res settings	\$30,000
Voco Solflex 170HD 	Three	31.8 cm W × 29.6 cm D × 46.8 cm H (68 cm H clearance needed to open printer)	Pyramis	DLP	25–200 µm	63 µm	68 cm W × 12.1 cm D × 18 cm H		Fast printing up to 12 cm/hour depending on layer thickness, material, etc.	\$15,000
SprintRay 95S 	Three	38.1 cm W × 43.9 cm D (54.1 with lid open) × 53.1 cm H (68.6 cm with lid open)	Rayware (free)	DLP	50 µm, 100 µm, 170 µm	95 µm (or 55 µm with 55S printer)	18.2 cm W × 10.2 cm D × 20 cm H (10.5 cm L × 5.9 cm D × 20 cm H for 55S)		About 5 cm/hour	\$18,000





Splint Application Comparisons

Splint Software Comparison											
SOFTWARE	REQUIREMENTS	TURNOVER TIME	COST	REVISION	EXPORT FILE	NAME EMBOSSED	MISC +	MISC -	PRE OP ADJ TIME	DELIVERY TIME (BG)	LEARNING CURVE
InLab Splint	inLab 22 Windows 10	30-40 min	\$3k (\$30k Prime Print)	spacer occlusion VDO	.sp .bld .stl	Y	Wall Thickness CO accuracy	Static occlusion. Sculpt Tool deficiencies.	15 min	5-30 min Max 5-15 min Mand	Hour+ CDOCS Videos
DS Core Create	Web	<1week	\$28.00	on request	.bld	Y on request	\$	subjective revisions	15 min	15-30 min	
Medit Splint Manual AI	Medit Web Win10 or MAC Download Account	30+ min. <5 min. refine time	Free- Export Fee?	Multi Steps PRN	.stl .stl	Y Y	Free Sculpt Tools	Static occlusion. Thickness: Ck w X Sx	15 min	10-30 min Max 5-15 min Mand	Medit Academy
3Shape Automate	Win10 or MAC (Trios Scanner)	2 D 10 min.	9.99- \$14.99	Dr can amend	.stl	? on request?	Fast Impressive		15 min	<30 min	
D3 Splint	Win10 or MAC	30++ min.	\$650.00	Multi Steps	.stl	Y Model Label	Articulator	Learning Curve***	15 min	30 min+	MANY HOURS!
Meshmixer	Win10 or MAC	<10	Free	PRN	.stl .ply	Label Emboss	Multi Uses	Learning Curve	NA	NA	Hour+



DS Core Create

1 Select a service

2 Define the service

3 Upload patient files

4 Finalize your order

Define the service

Select arches

Upper

Continue

Define treatment details

Select your workflow

Work with DS Core Create

Service type

Design service

Ready to Print Design Service for Primeprint?

Yes

Material

Primeprint Splint ST

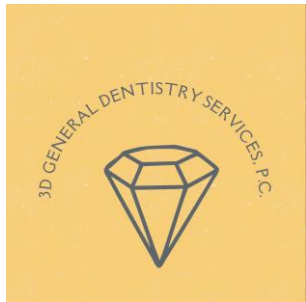
*Note that the minimum material thickness is 0.8 mm

Type of splint

Flat with canine guidance

Fit

Mid



DS Core Create

1 Select a service

2 Define the service

3 Upload patient files

4 Finalize your order

☐ I'm using a Dentsply Sirona scanner

Upper Jaw*



B Goodspeed for splint 2023-12... X

Lower Jaw



B Goodspeed for splint 2023-12... X

Bite

↑

Drop files here or [browse](#)

Supported formats
.stl, .ply

Optional image or file

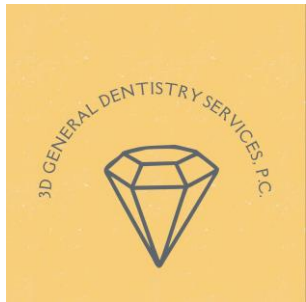
↑

Drop files here or [browse](#)

Supported formats
.jpg, .jpeg, .png, .tiff, .tif, .bmp, .stl, .ply, .obj, .cam, .blc, .rst, .lab, .ppt, .pptx, .doc, .docx, .xls, .xlsx, .3dpdf, .pdf, .mdl, .sp, .pf, .avi, .mov, .mp4, .wmv, .sixd, .3oxz, .xorder2, .exo, .zip, .dem, .cmg.dxd, .dxd, .dsc0

+ Add more files

Continue



DS Core Create

1 Select a service

2 Define the service

3 Upload patient files

4 Finalize your order

Select your provider

 DS Core Create Lab
Dentsply Sirona

Delivery method

Standard delivery

After the order is accepted, you will receive the design service within 6 working hours.

☒ Share patient information

 Patient information

Patient information will be shared in the order.

Additional comments

Additional comments

Order Summary

Nightguard / Splint

\$28.00

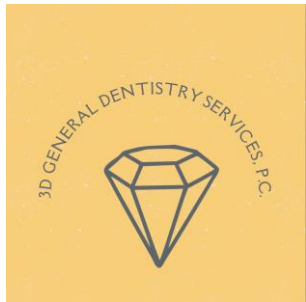
(excl. VAT \$0.00)

Grand total

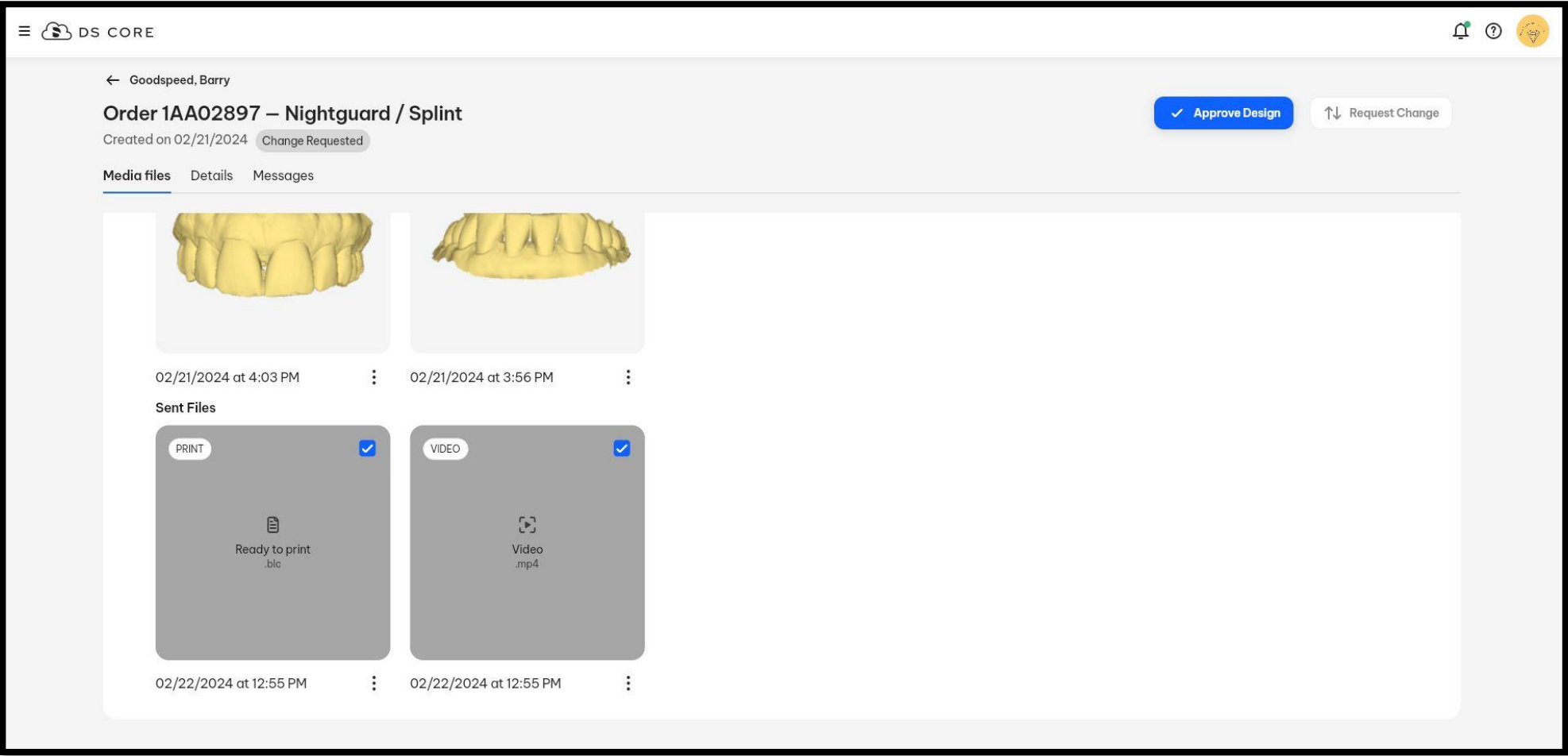
\$28.00

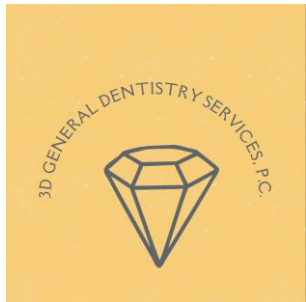
By placing your order, you agree to Dentsply Sirona [terms and conditions](#) for DS Core Create.

Place order

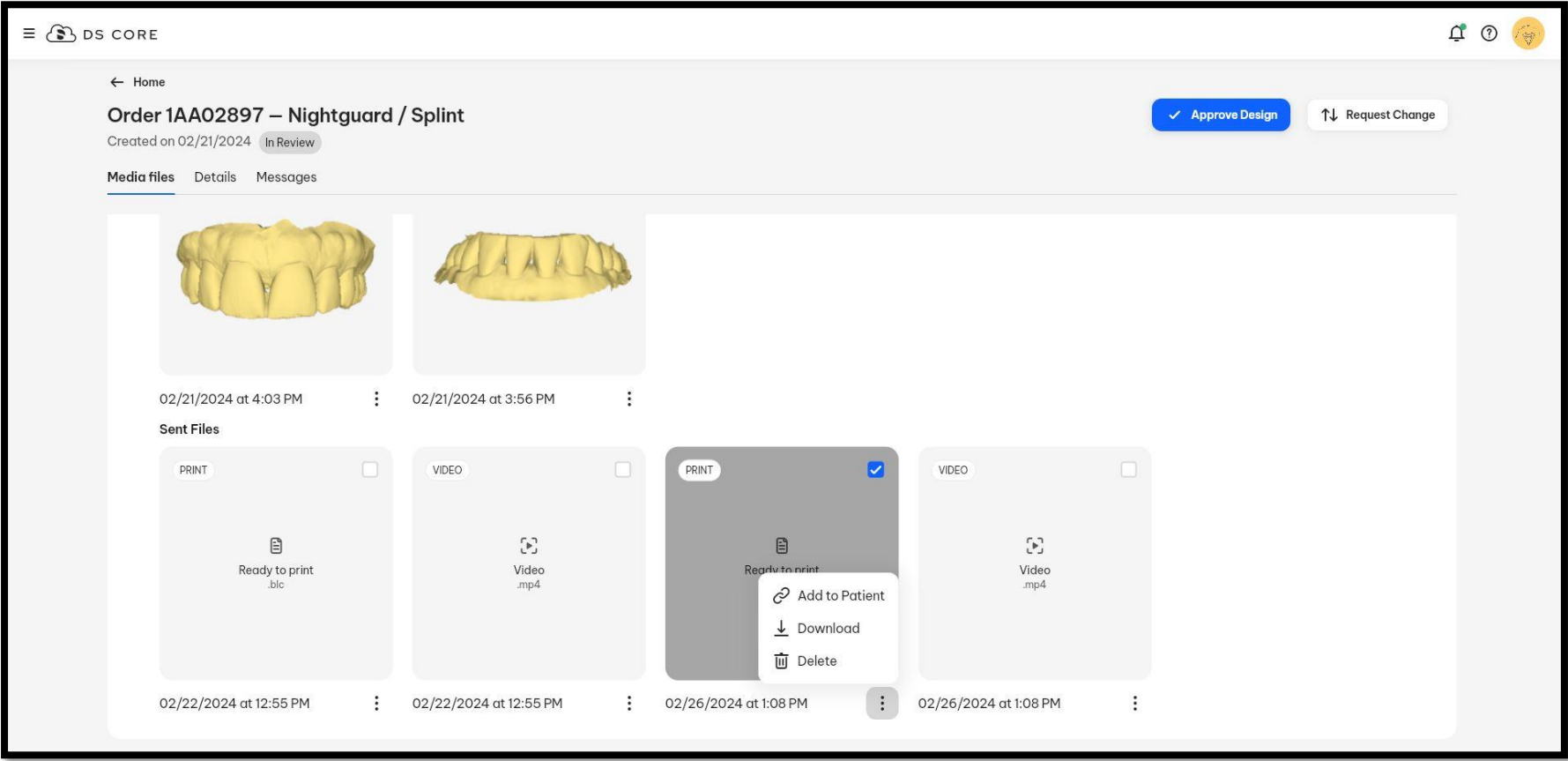


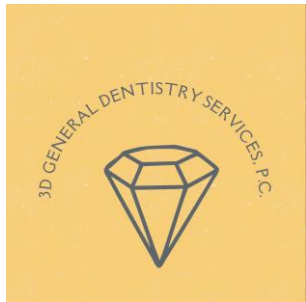
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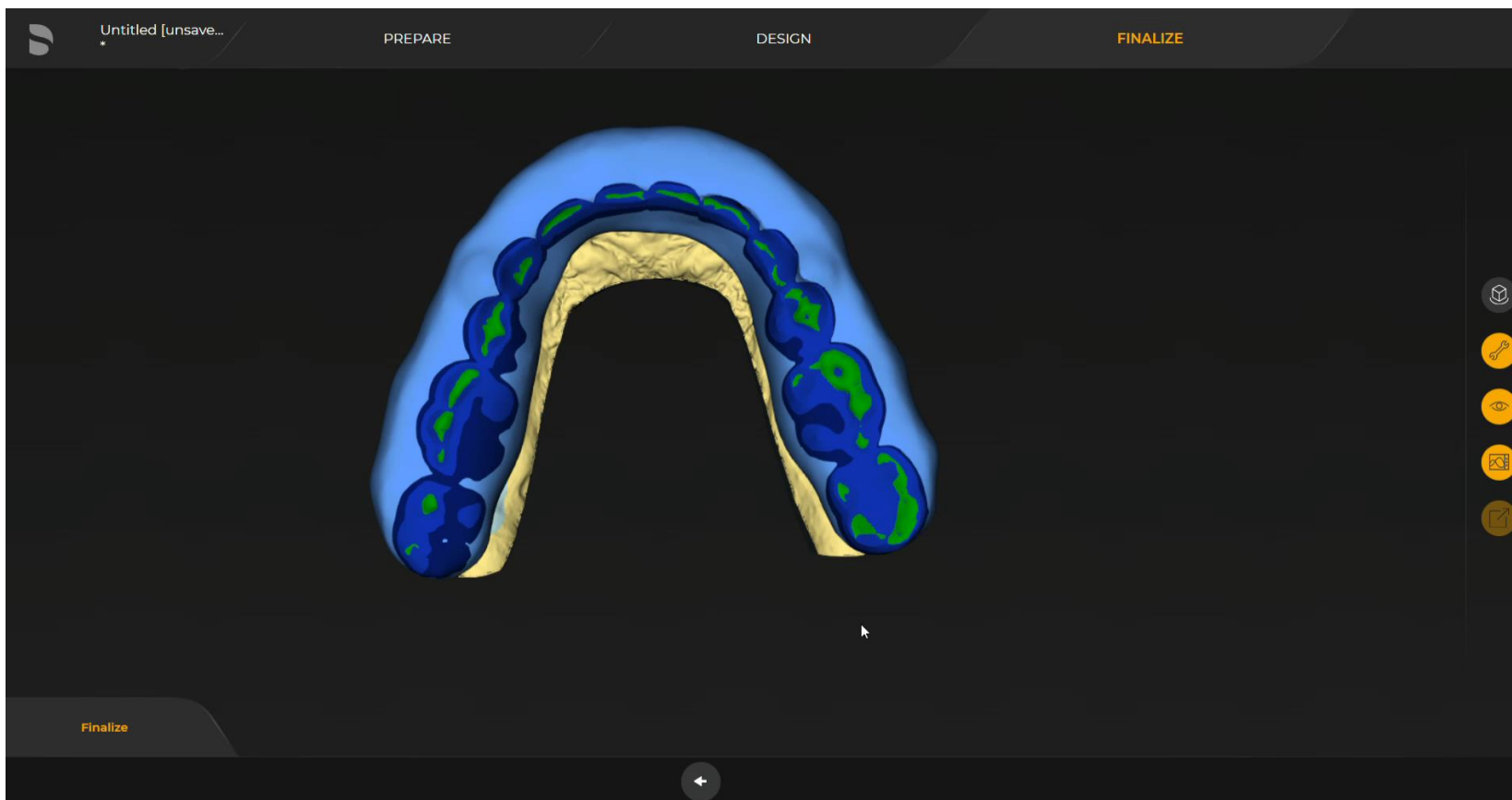


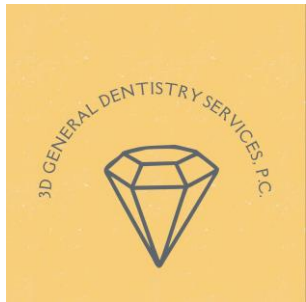
DS Core Create



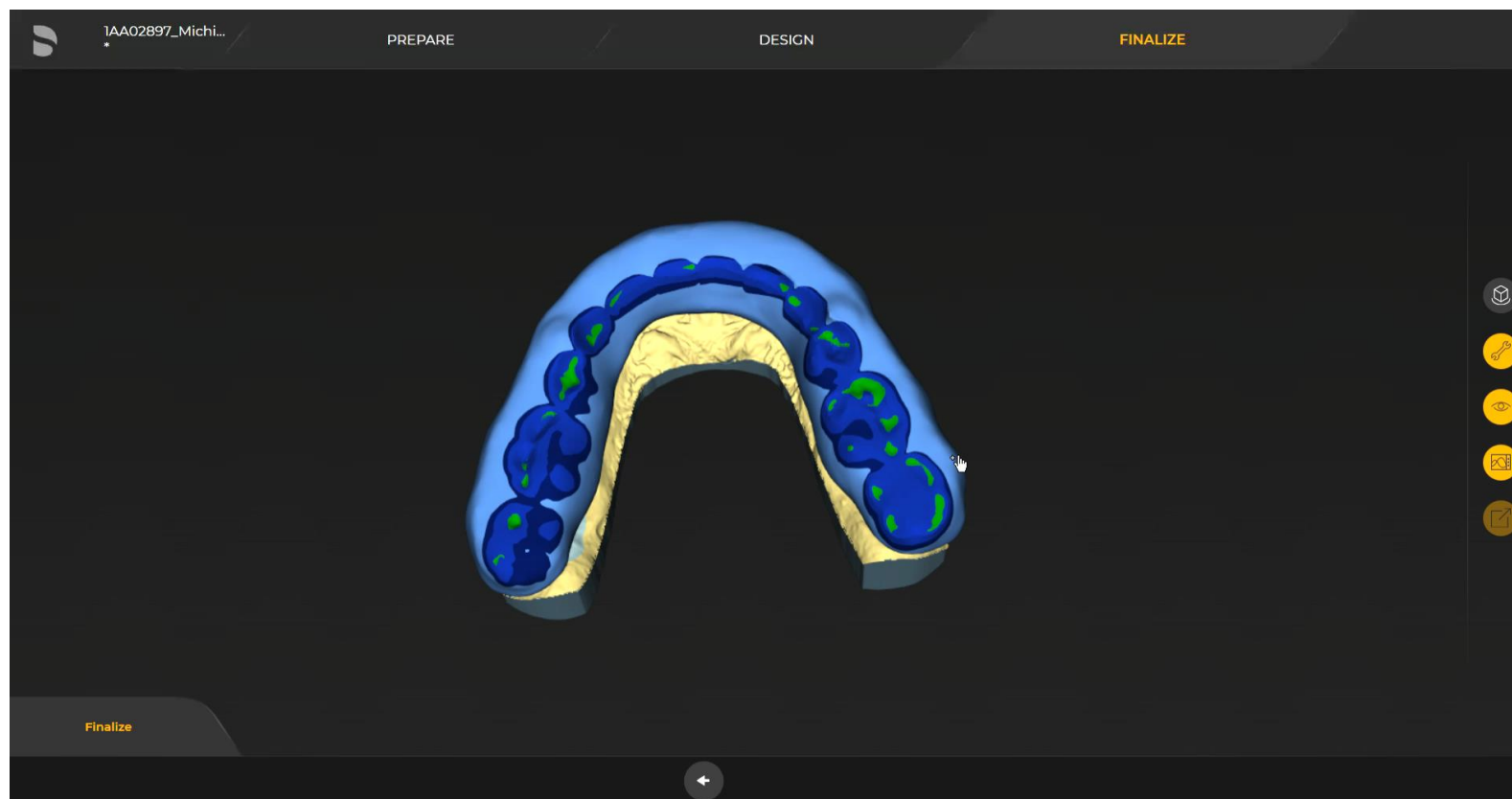


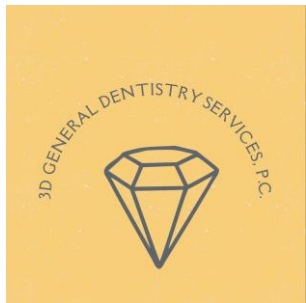
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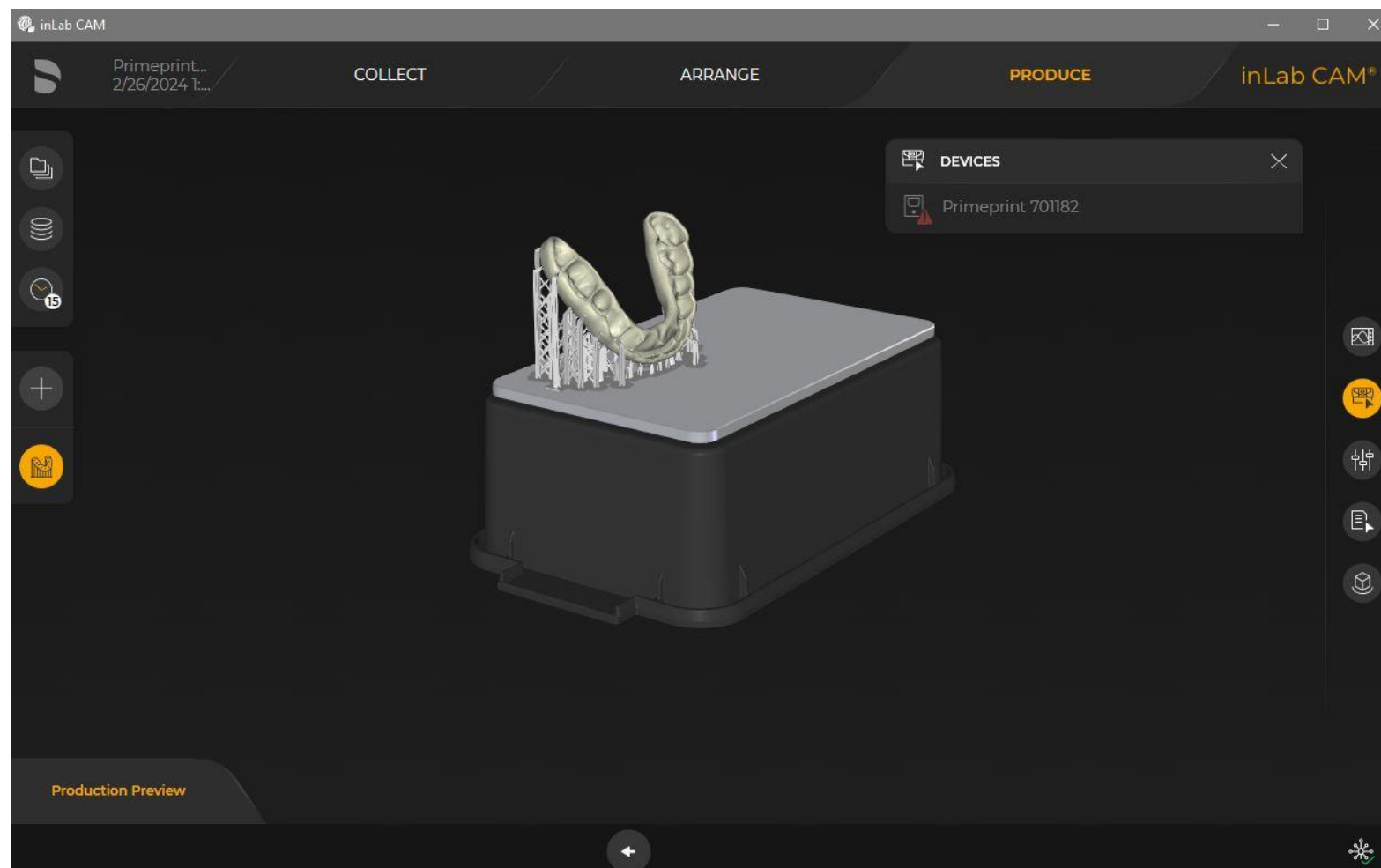


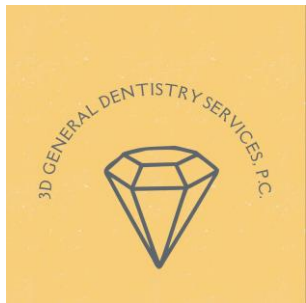
DS Core Create





DS Core Create: .blc file not .sp or .stl





Medit Splints

Medit Link
register account

https://www.meditlink.com/register

Create Your Medit Link Account



Clinic



Lab

Administrator
Dentist (Manager)

All Medit Link functions are available.

- ✓ Order
- ✓ Member Management

Register

Administrator
Representative/Leader (Manager)

All Medit Link functions are available.

- ✓ Order Management
- ✓ Member Management

Register

Member
Dental Hygienist and Dental Staff

In order to use Medit Link, join your group as a member. Case management and basic functions will be available after you join the group.

- ✓ Oral Scanning

Register

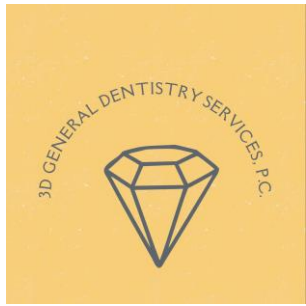
Member
Laboratory Employees

In order to use Medit Link, join your lab's group as a member. Case management and basic functions will be available after you join the group.

- ✓ Receiving Data for Making Dental Prostheses
- ✓ Sharing work files and production processes.

Register

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Medit Splints

Work Box

New Case

MEDIT Link 3.2.1

Barry Goodspeed







Dashboard



In Box



Work Box

Work Box

 All |  Form Only |  Need Processing |  Scan Completed |  CAD |  CAM |  Mill |  Done

View Options



Total Cases: 42

 Refresh

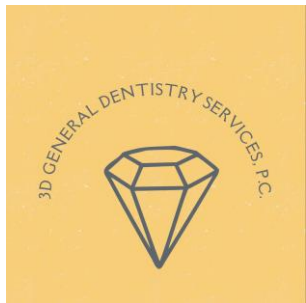
 1/1/2018~3/8/2024

All

 All / Contains

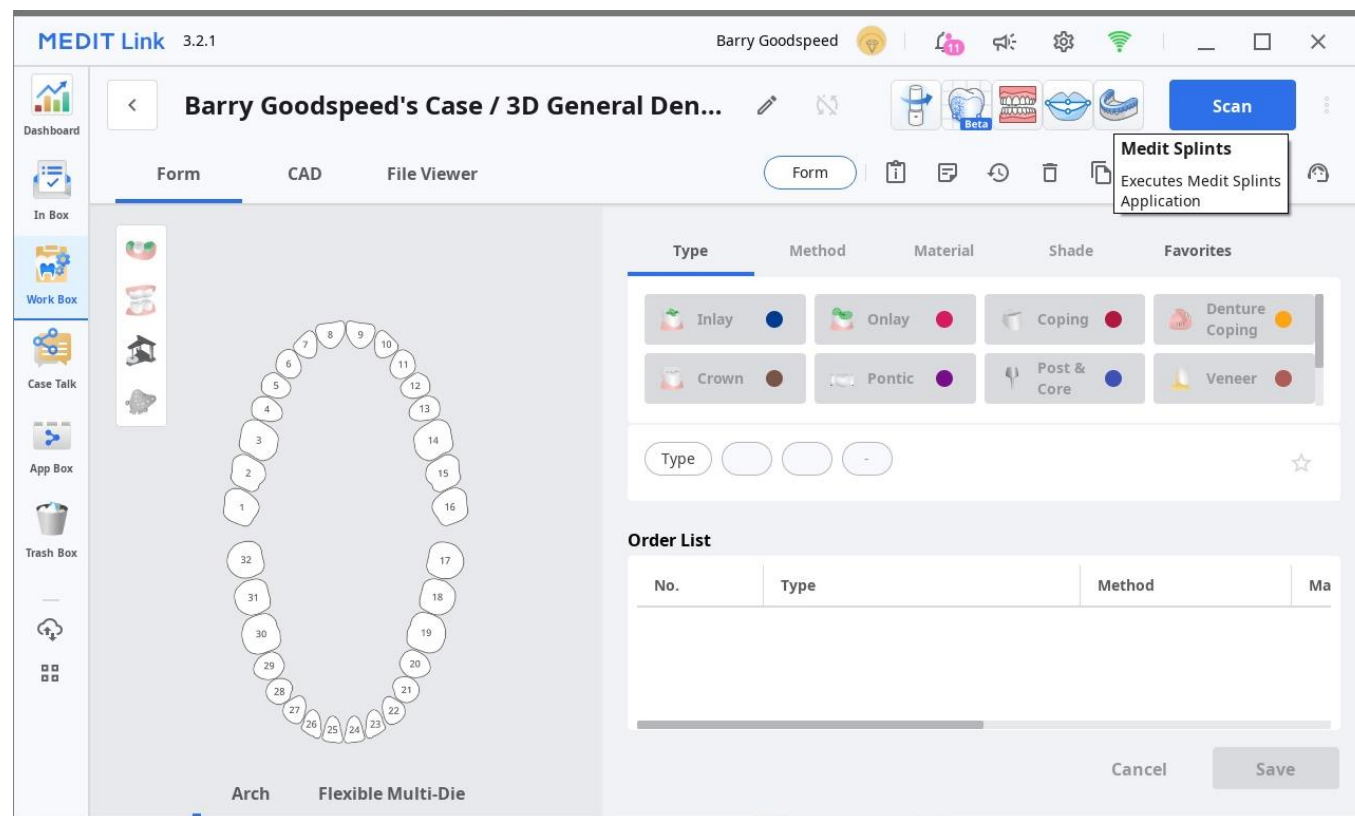


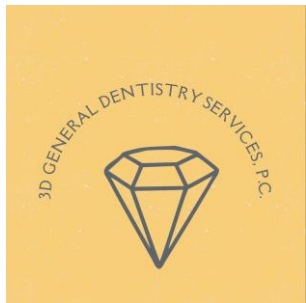
Status	Case Name	Patient Name ↑	Form Information	Last Modified Date
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Medit Splints

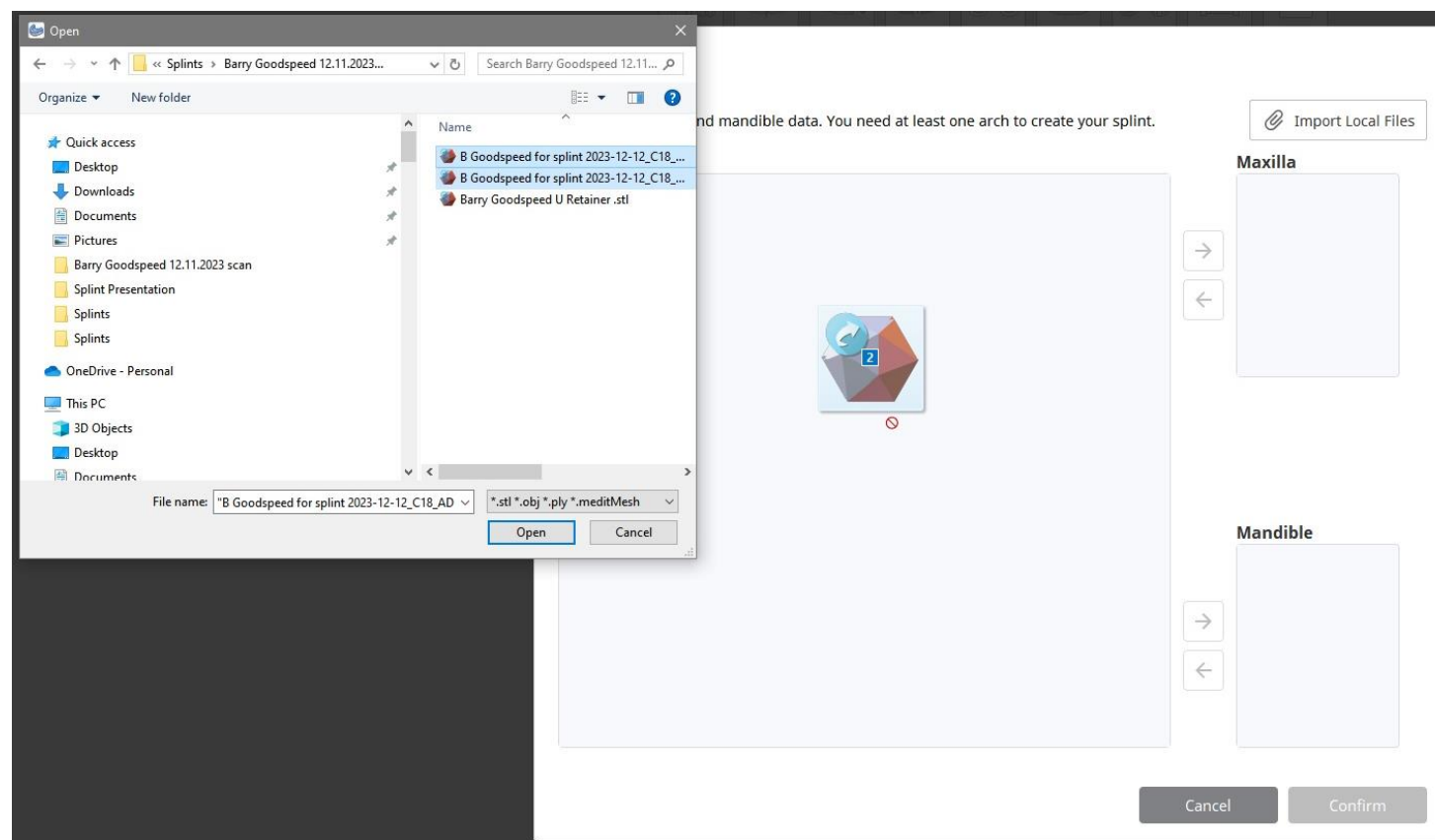
Open Splint Module

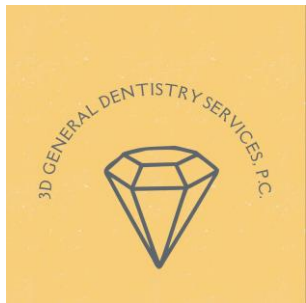




Medit Splints

Import.
Upload STL files





Medit Splints

Import.
Upload STL files

Assign Data

Assign the maxilla and mandible data. You need at least one arch to create your splint.

 Import Local Files

Data

▼ Imported Local Files



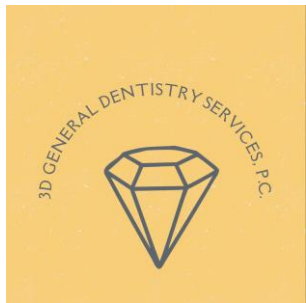
B Goodspeed for
splint 2023-12-12_C...



B Goodspeed for
splint 2023-12-12_C...

Maxilla





Medit Splints

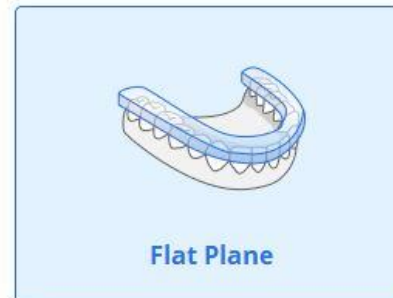
Choose Arch
+ Splint Type

Arch & Splint Type

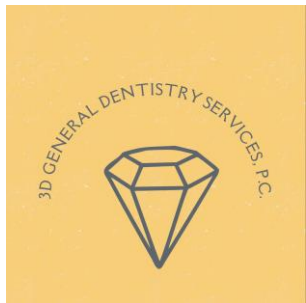
What arch is the splint for?



What splint type are you creating?



Confirm



Medit Splints

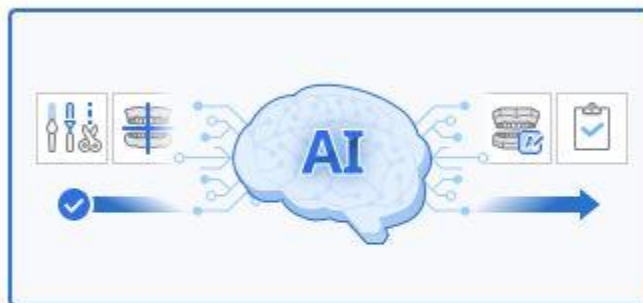
Choose
Manual

Or

AI

Creation Type

Choose Creation Type



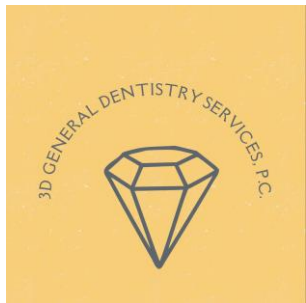
Auto Creation



Manual Creation

Parameter Settings

Confirm



Medit Splints

Parameters

Parameter Settings

Occlusal Adjustment Mode

Distance to Antagonist (mm)

2.0

Inner Surface Creation Mode

Inner Surface Offset (mm)

0.09

Smooth Surface



Angle °

0.1

Retention

0.20

Outer Surface Creation Mode

Lingual & Buccal Thickness (mm)

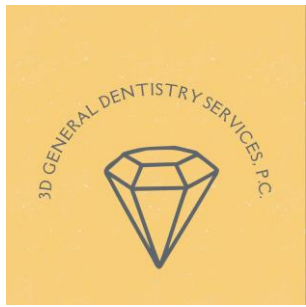
2.00

Smooth Surface



Cancel

Confirm

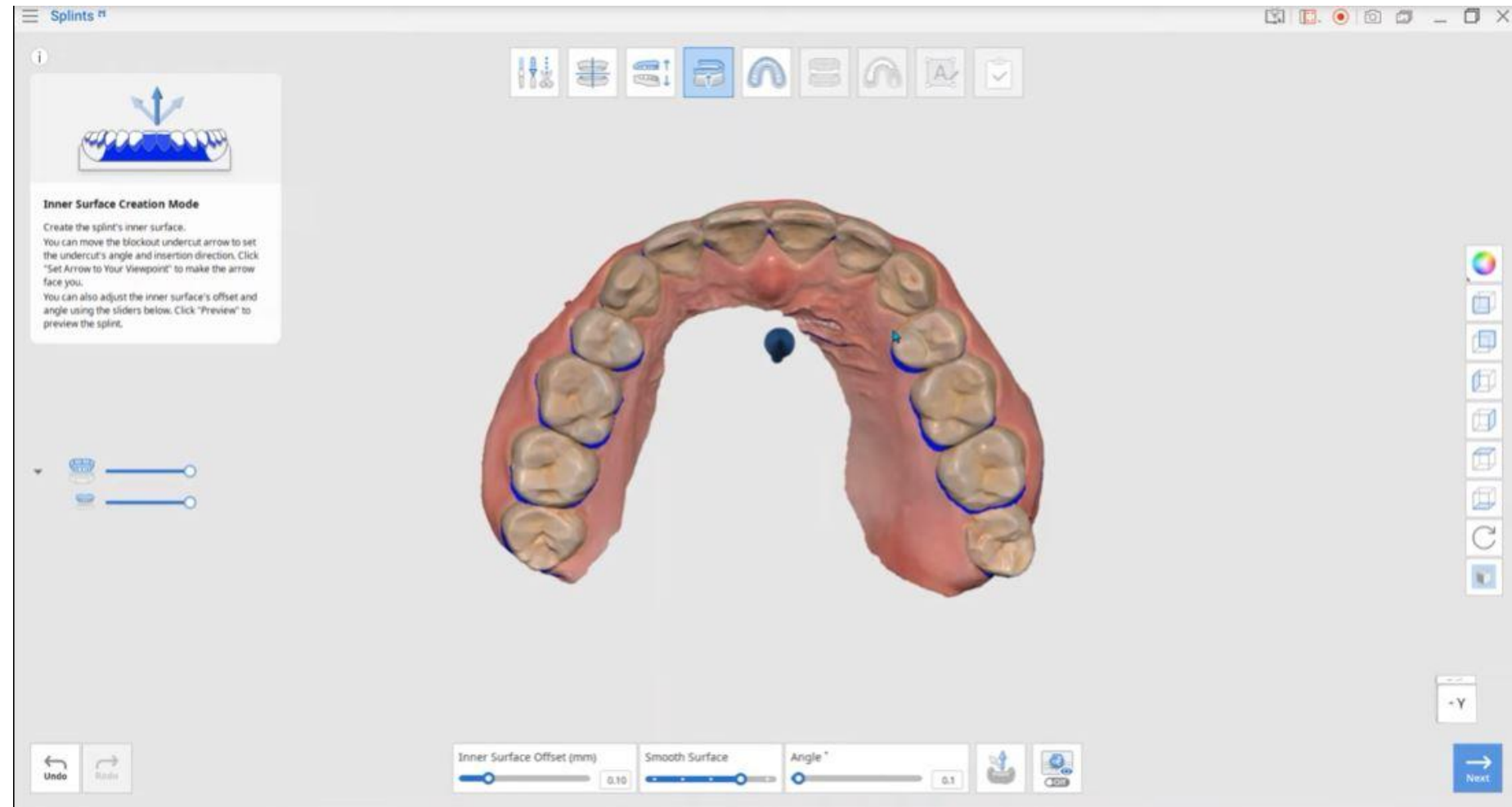


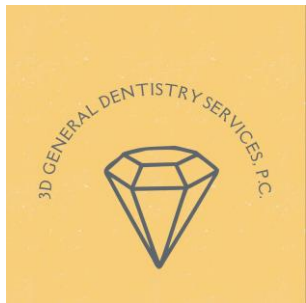
Medit Splints

Parameters

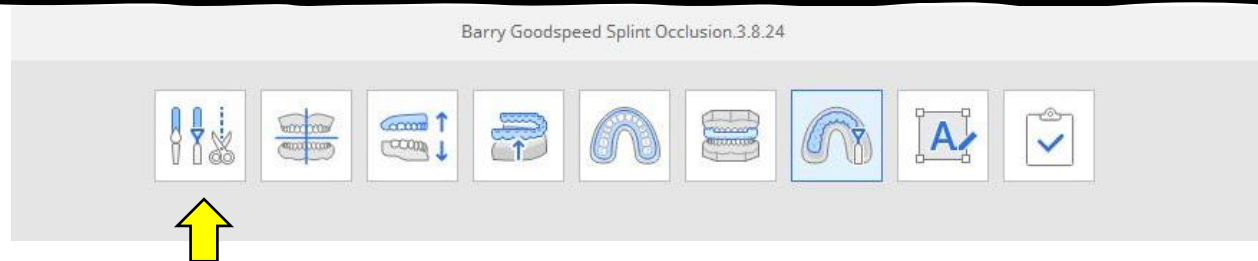
Offset = 0.100

100u



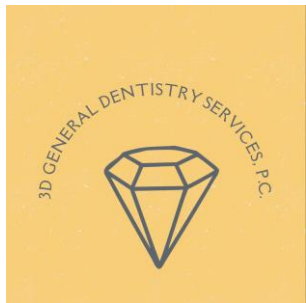


Medit Splints. Manual

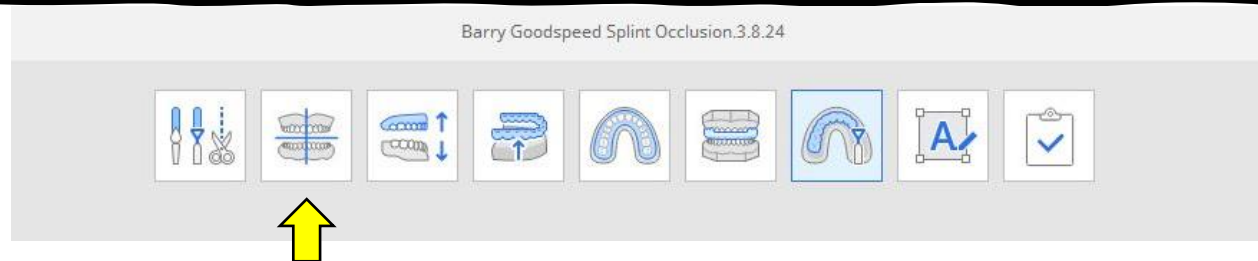


Choose **Manual** . Set Parameters

- ➔ a. Edit and Trim Excess Data
- b. Set Model Axis. Digital Facebow
- c. Occlusal Adjustment. Relationship
- d. Inner Surface Creation
- e. Outline Designation
- f. Outer Surface Creation
- g. Design Mode. Occlusion Tweak. Snap to Anatagonist
- h. Labeling
- i. Completion
- j. Save. Export STL's of Splint, Models, Screen Shots

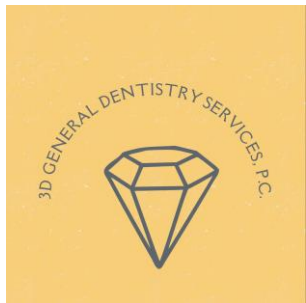


Medit Splints. Manual



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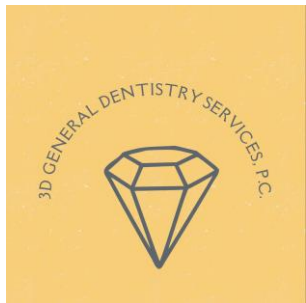


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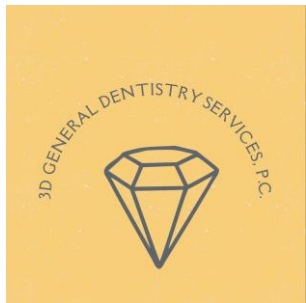


Medit Splints. Manual

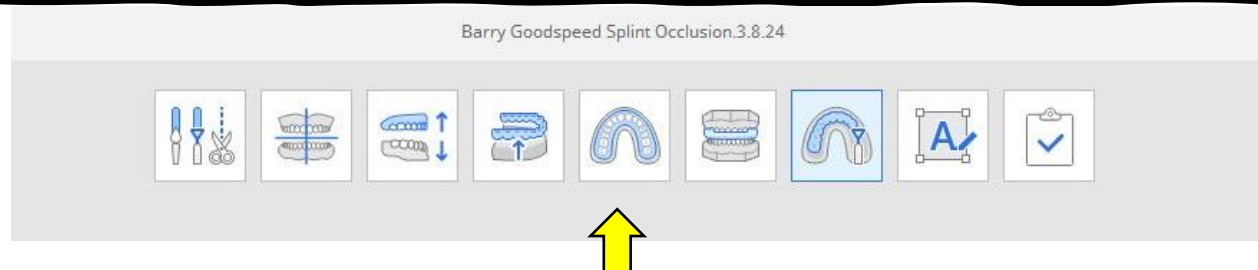


Choose **Manual** . Set Parameters

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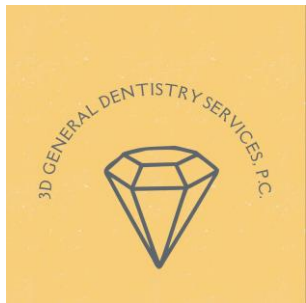


Medit Splints. Manual

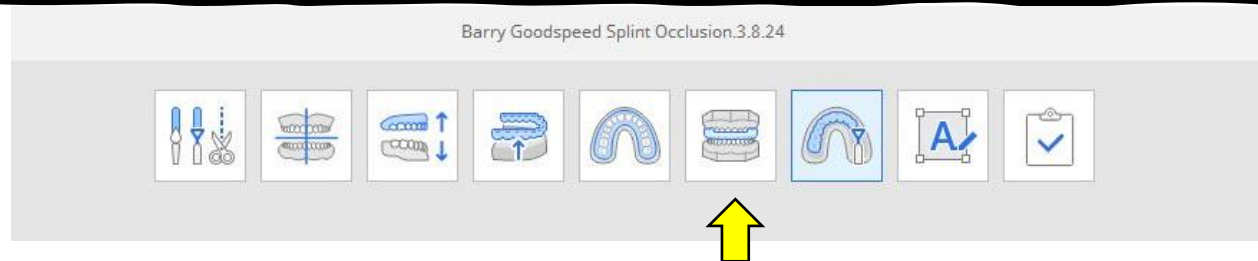


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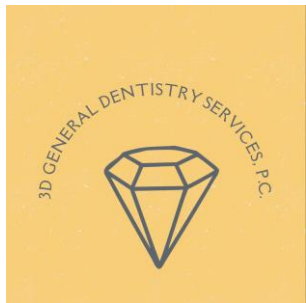


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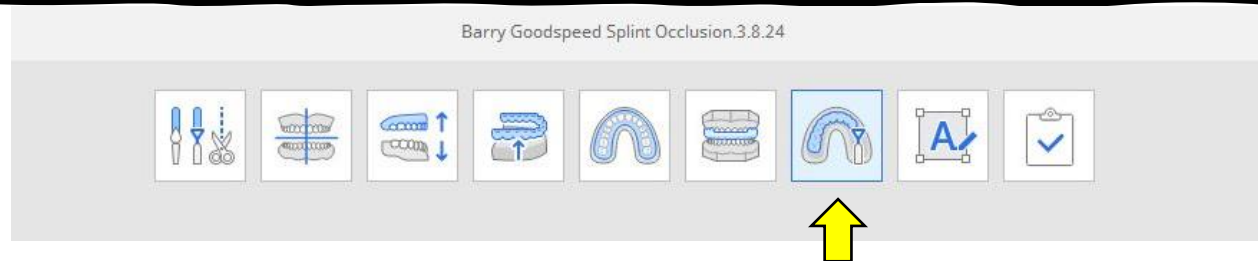


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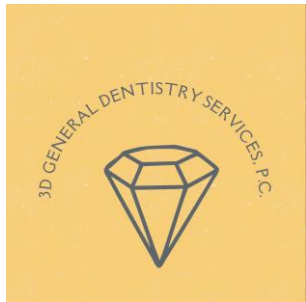


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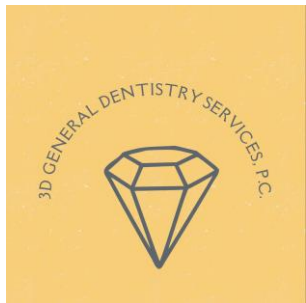


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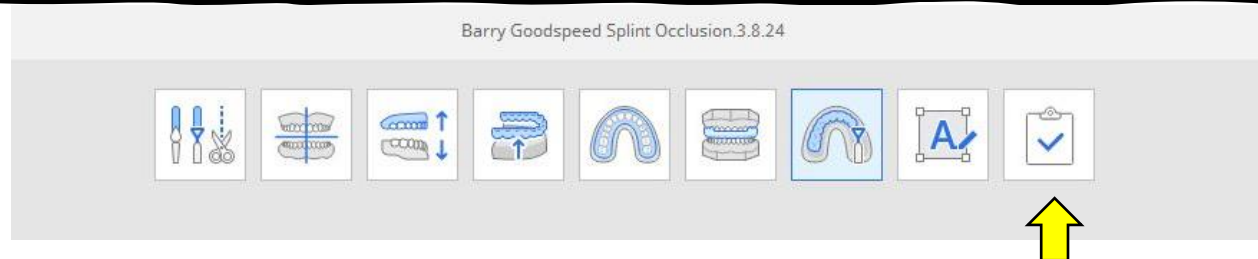


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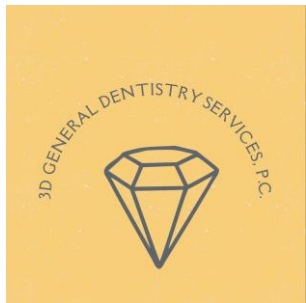


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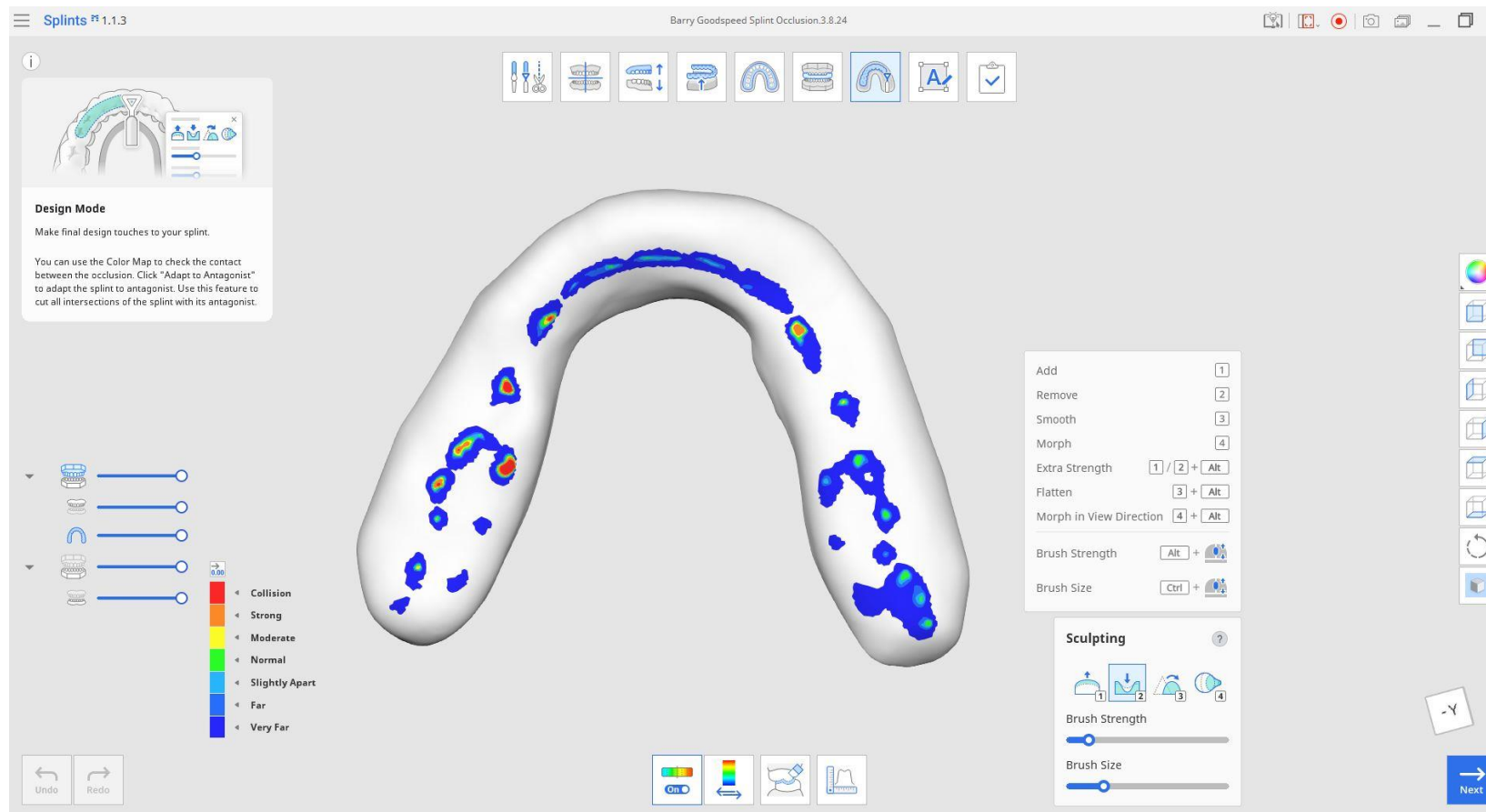


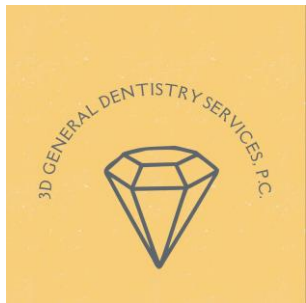
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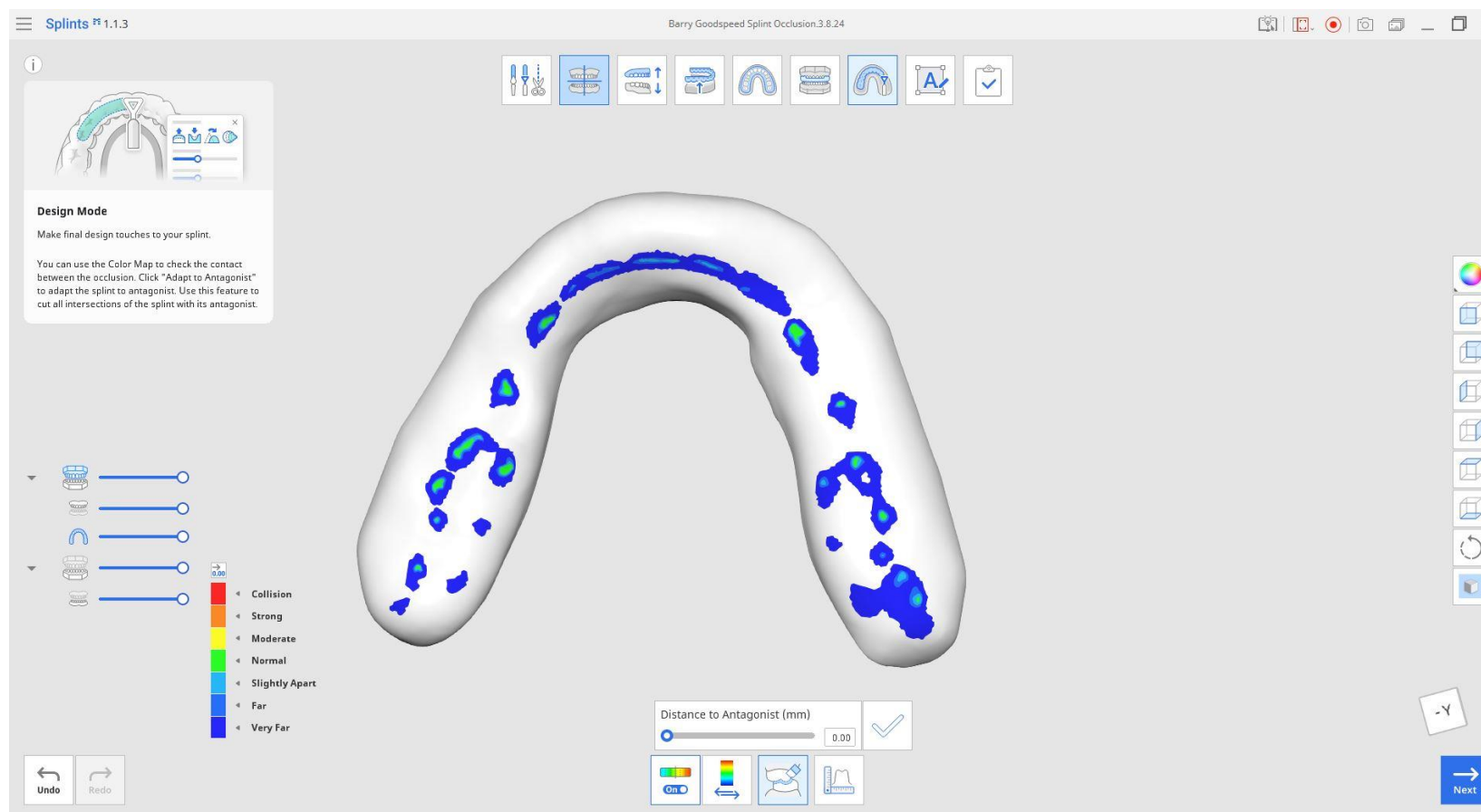


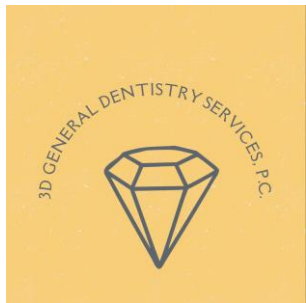
Medit Splints. Design. Occlusion



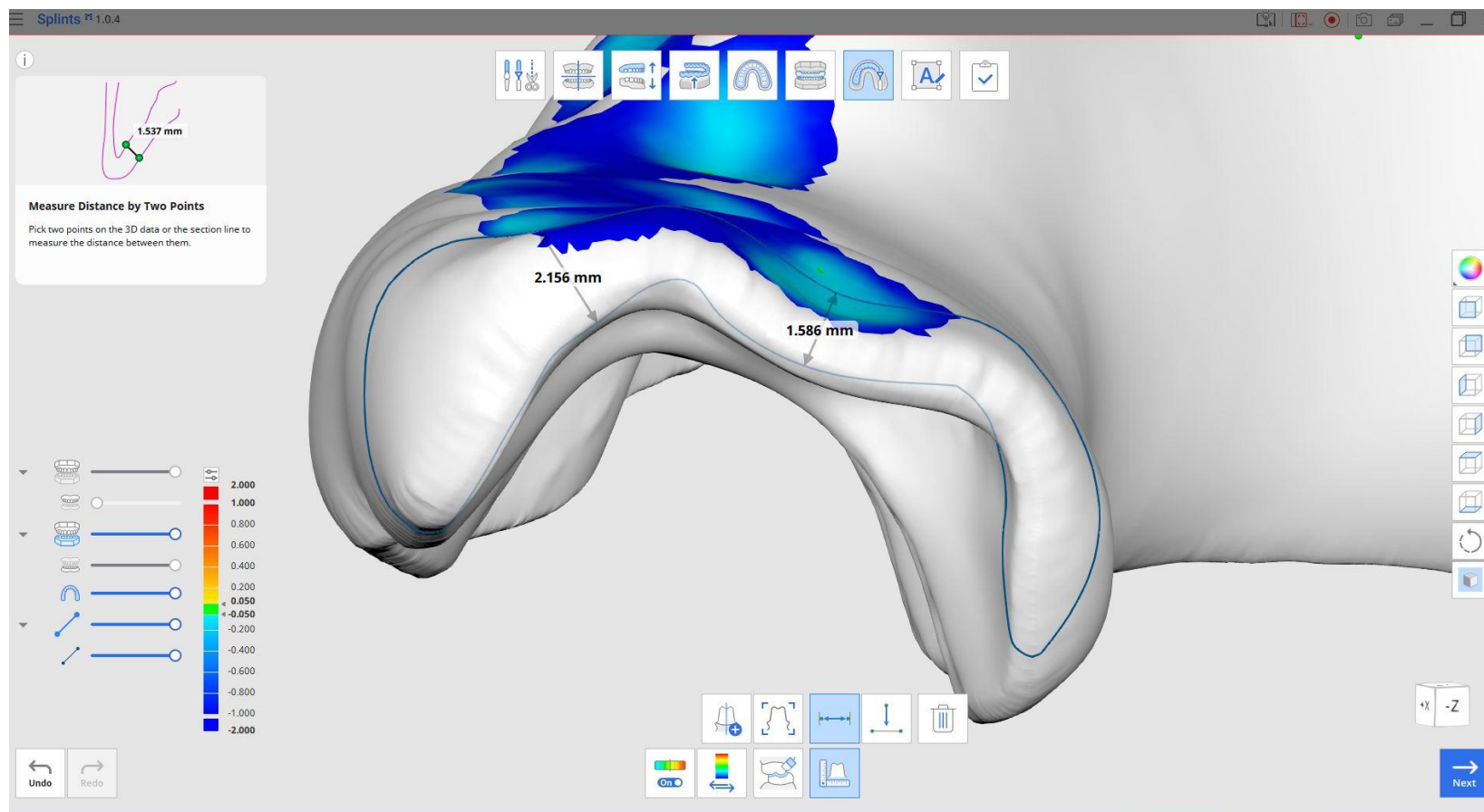


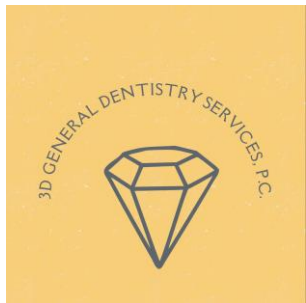
Medit Splints. Design. Occlusion





Medit Splints. Cross Section





Medit Splints. Export

Export Files in This Case

Options

File List

CAD

dentalProject

Attachment

3D Data

Goodspeed. Barry 2023-07-07_C15_ADA_UpperJaw.stl

Goodspeed. Barry 2023-07-07_C15_ADA_LowerJaw.stl

Images

Baarry Goodspeed portrait.jpg

Splints

Barry Goodspeed Splint Occlusion.3.8.24

☒

Splint

Splints_Mandible

Splints_Maxilla

Barry Goodspeed Splint Occlusion.3.8.24.meditSplints

☐

Compress Files

☐

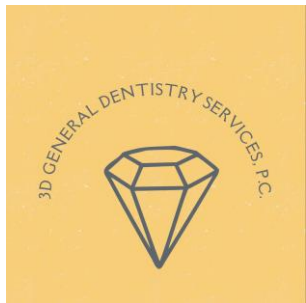
Combine Individual Mesh

☐

Save Case Information as PDF [Preview](#)

Close

Export



Medit Splints

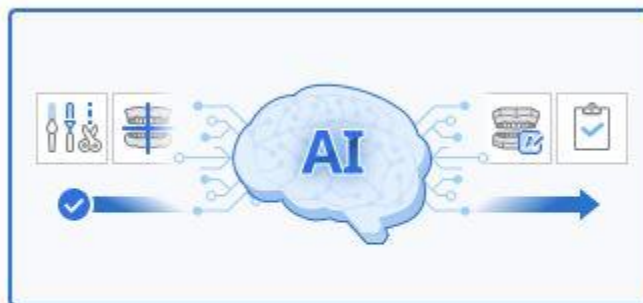
Choose
Manual

Or

AI

Creation Type

Choose Creation Type



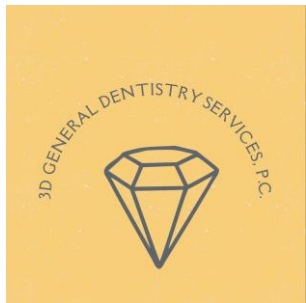
Auto Creation



Manual Creation

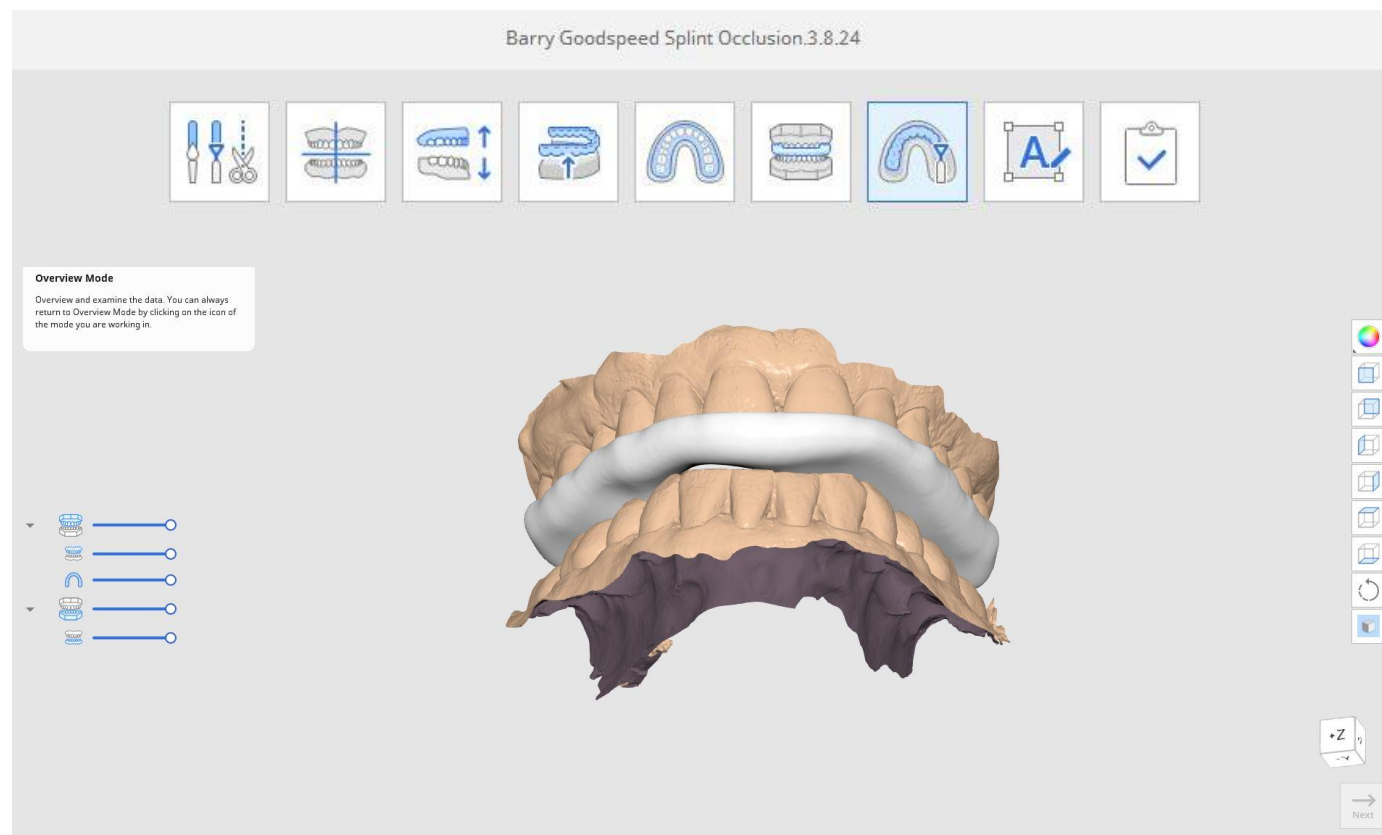
Parameter Settings

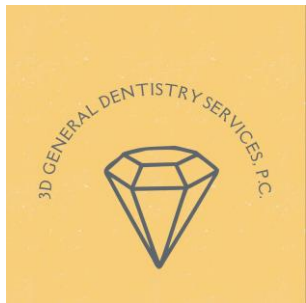
Confirm



Medit Splints. AI

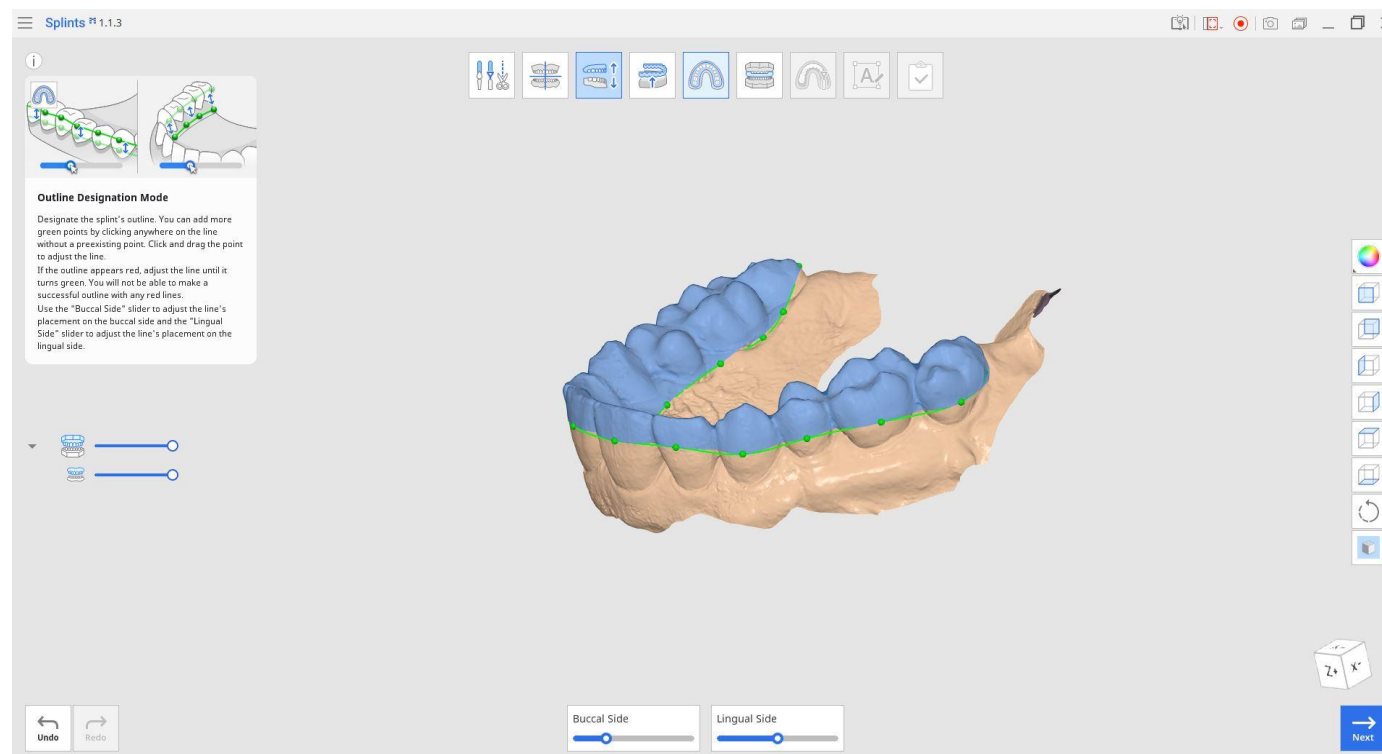
- AI initial design
- AI tweak as needed.
- Go to any of Manual Steps to Tweak

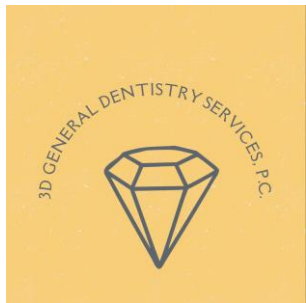




Medit Splints. AI

- AI initial design
- AI tweak as needed.
- Go to any of Manual Steps to Tweak

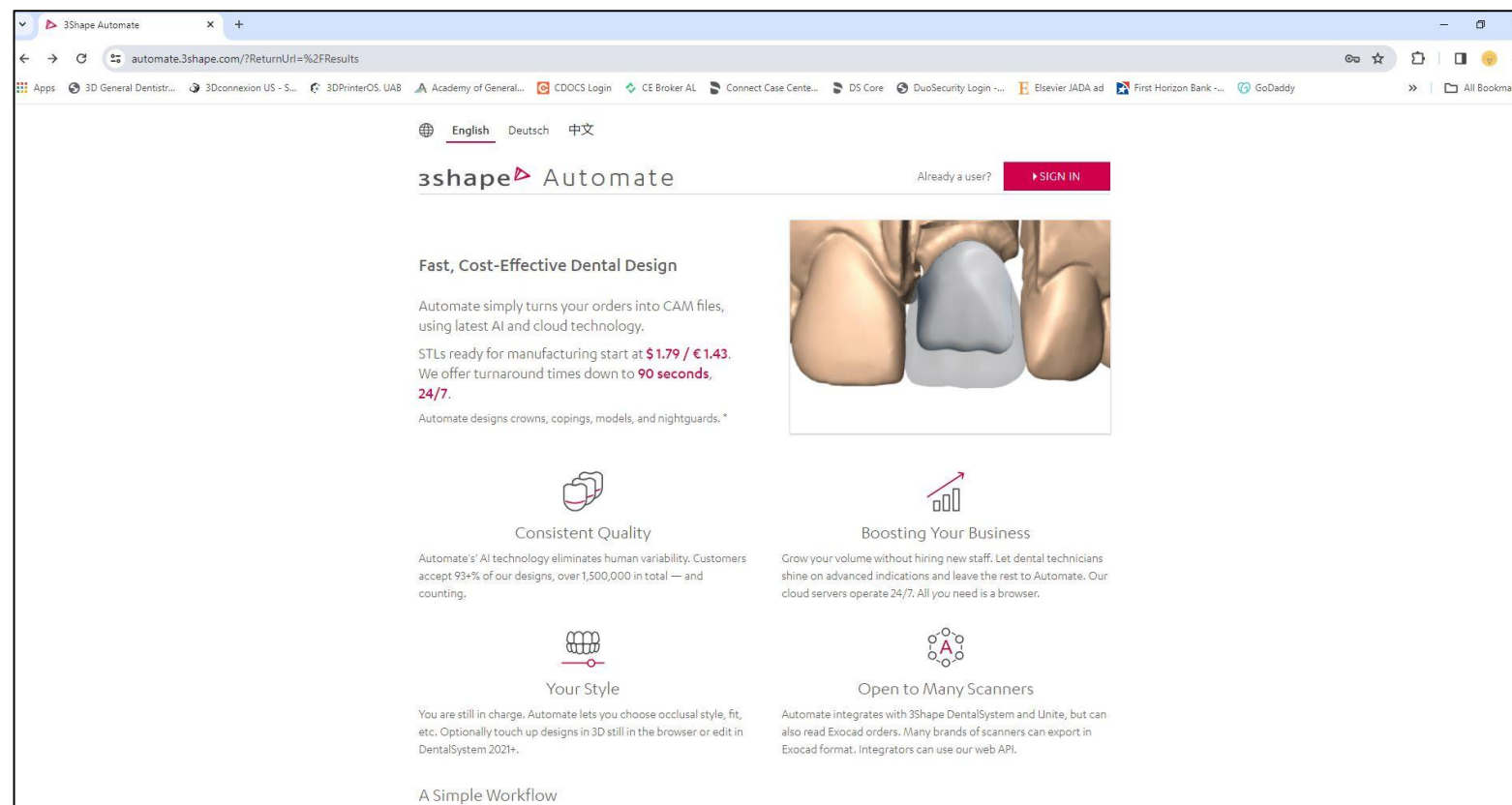


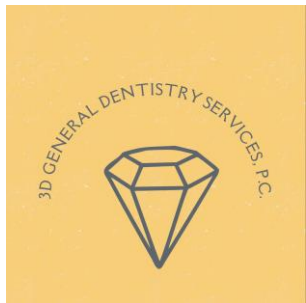


3Shape Automate

<https://automate.3shape.com/>

Register account





3Shape Automate

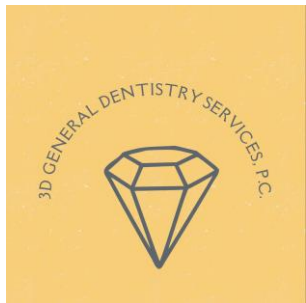
<https://automate.3shape.com/>

Select Product

Choose Settings

Thickness Occl., Wall	1 mm
Inward Retention	0.20 mm
Offset	0.05
Crevice Blockout	Mod
ID	

The screenshot displays the 3Shape Automate web interface. At the top, there's a navigation bar with '3shape Automate', 'UPLOAD', and 'RESULTS' buttons. A status bar indicates '\$4.01 of your promotional credits will expire in 76 day(s)!'. Below this, a row of product categories is shown: Crowns, Copings, Nightguards (selected), Simple Models, and Forming Models. The 'DESIGN PREFERENCES' section includes settings for Occlusal Thickness (1.00 mm), Offset (0.05 mm), Crevice Blockout (Moderate), Min. Wall Thickness (1.00 mm), Inward Retention (0.20 mm), ID Tag (Name (last 4 letters)), Upper/Lower selection, and Cam Orientation (Tilted by 45°). A 'TURNAROUND TIME' section shows options for ~10 minutes (\$13.49* / \$14.99) or 10 hours (\$8.99* / \$9.99). A 'YOUR BALANCE' section shows a balance of \$4.01 and an 'ADD MONEY' button. The bottom section, 'CHOOSE ORDERS TO UPLOAD', features a drag-and-drop area with instructions: 'Drag and drop (zipped) order folders, or browse for [zipped order folders](#) or [order folders](#)'. A note at the bottom states: 'The folder or zip archive must contain upper and lower jaw scans, pre-opened or in static occlusion. You can also drop two jaw scan files together. File formats: .ply, .dcm, .stl, .obj'.



3Shape Automate

<https://automate.3shape.com/>

Upload STL Files

Submit

3shape Automate UPLOAD RESULTS drbarrygoodspeed@p...

\$4.01 of your promotional credits will expire in 76 day(s)! [Add money to continue as a customer.](#) [Request more free trial credit. \(automate@3shape.com\)](#)

Crowns Copings Nightguards Simple Models Forming Models

DESIGN PREFERENCES SAVE AS NEW DEFAULTS

Occlusal Thickness 1.00 mm Offset 0.05 mm Crevice Blockout Moderate Min. Wall Thickness 1.00 mm

Inward Retention 0.20 mm ID Tag Name (last 4 letters) Upper Lower Cam Orientation Tilted by 45°

TURNAROUND TIME and price of accepted design SAVE AS NEW DEFAULT

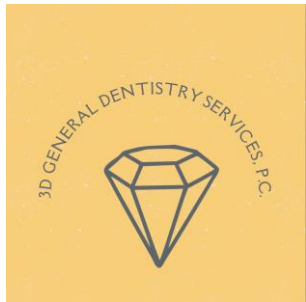
~ 10 minutes \$13.49* / \$14.99 10 hours \$8.99* / \$9.99

*: 3Shape LabCare customers

CHOOSE ORDERS TO UPLOAD

Drag and drop (zipped) order folders, or browse for [zipped order folders](#) or [order folders](#)

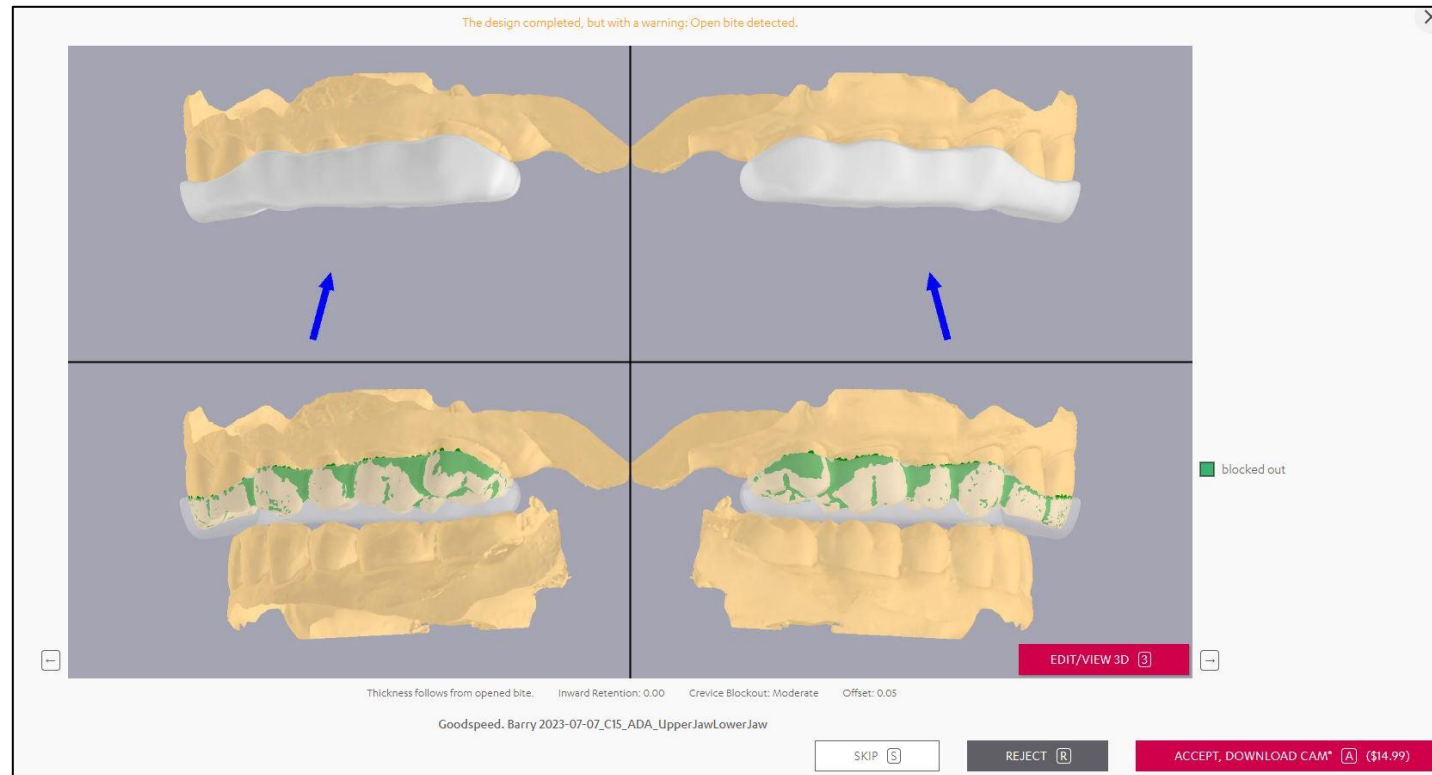
The folder or zip archive must contain upper and lower jaw scans, pre-opened or in static occlusion. You can also drop two jaw scan files together. File formats: .ply, .dcm, .stl, .obj

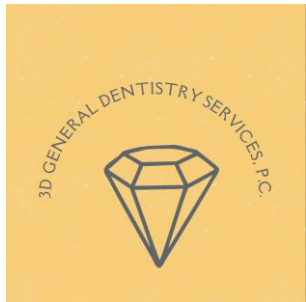


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views

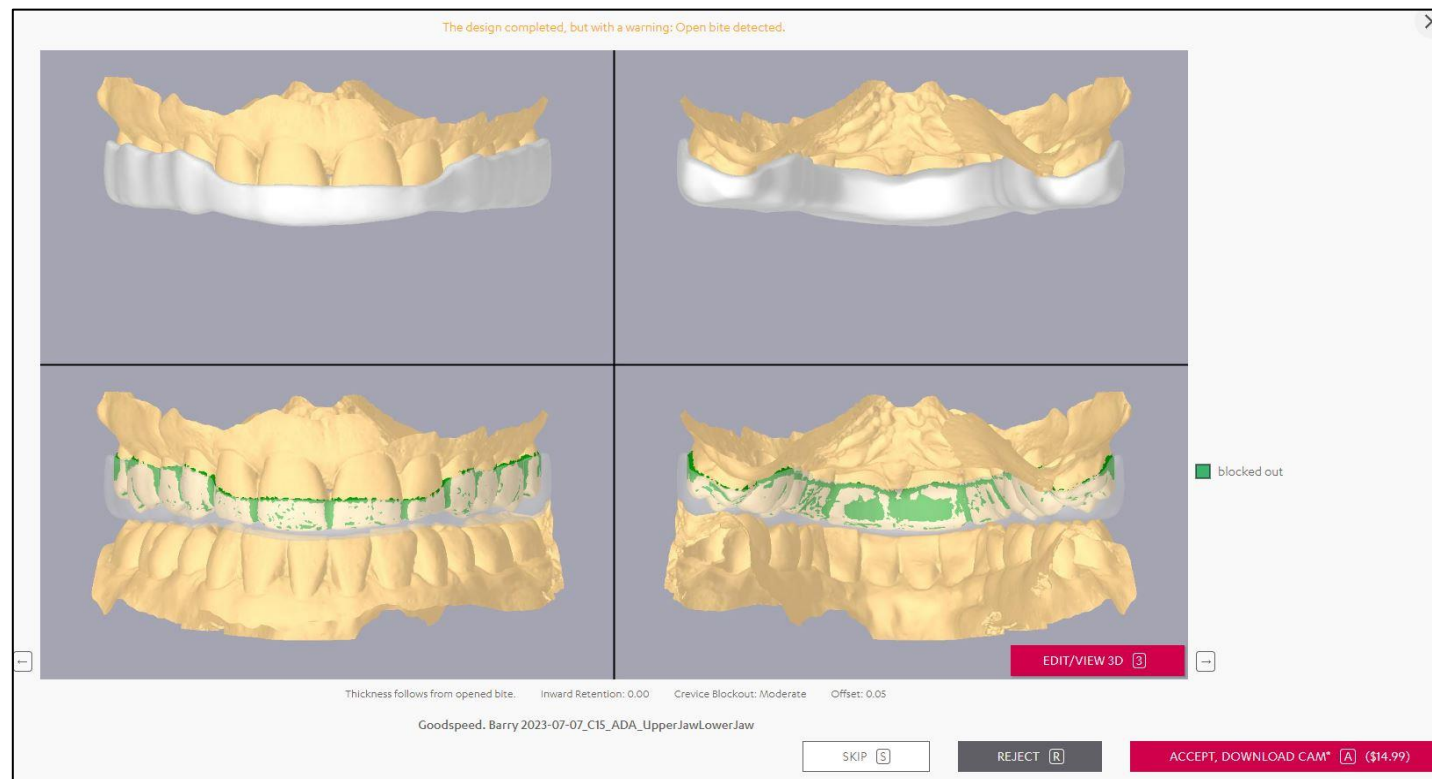


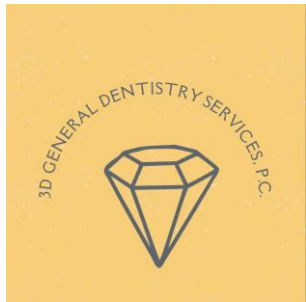


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views



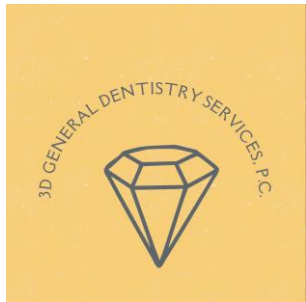


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views

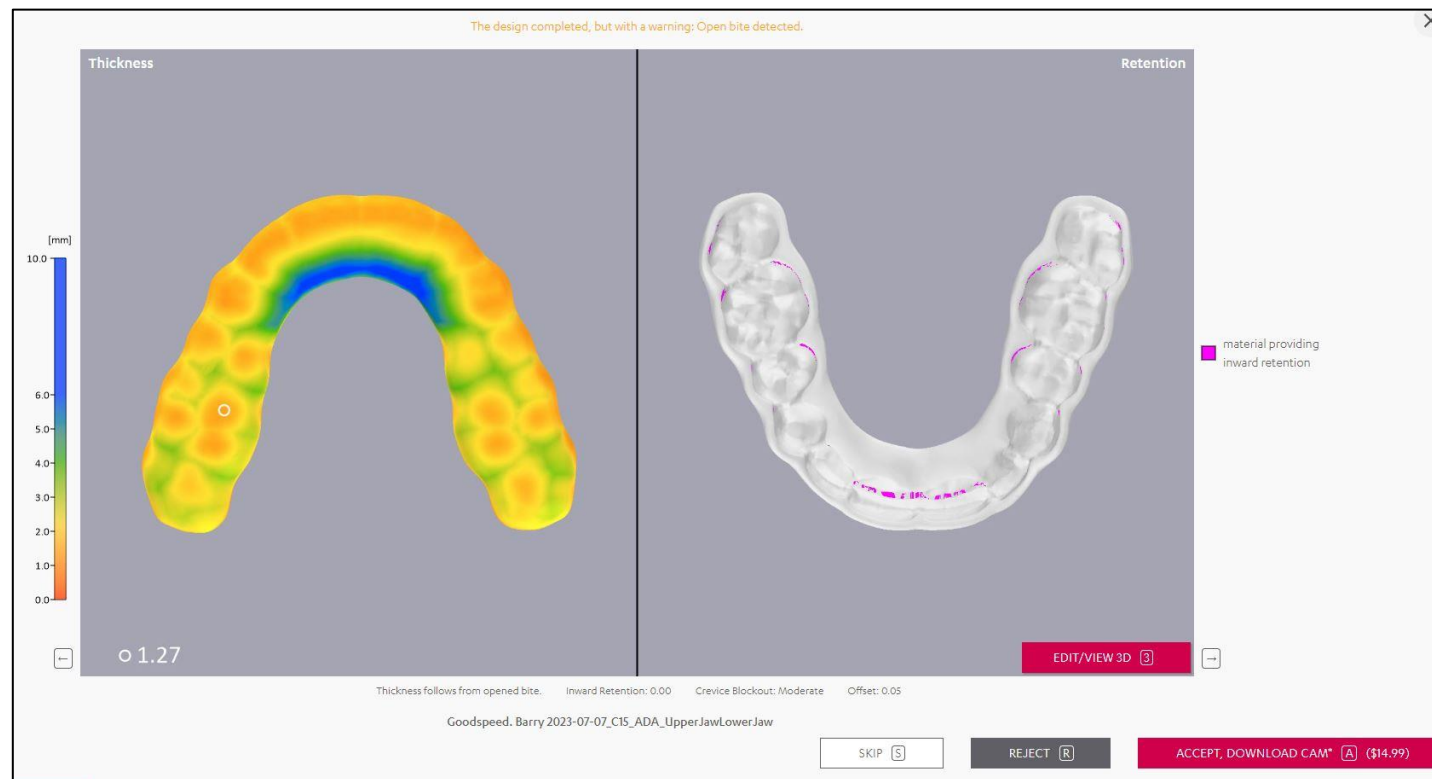


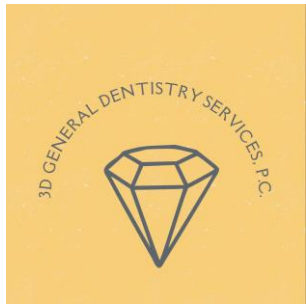


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views

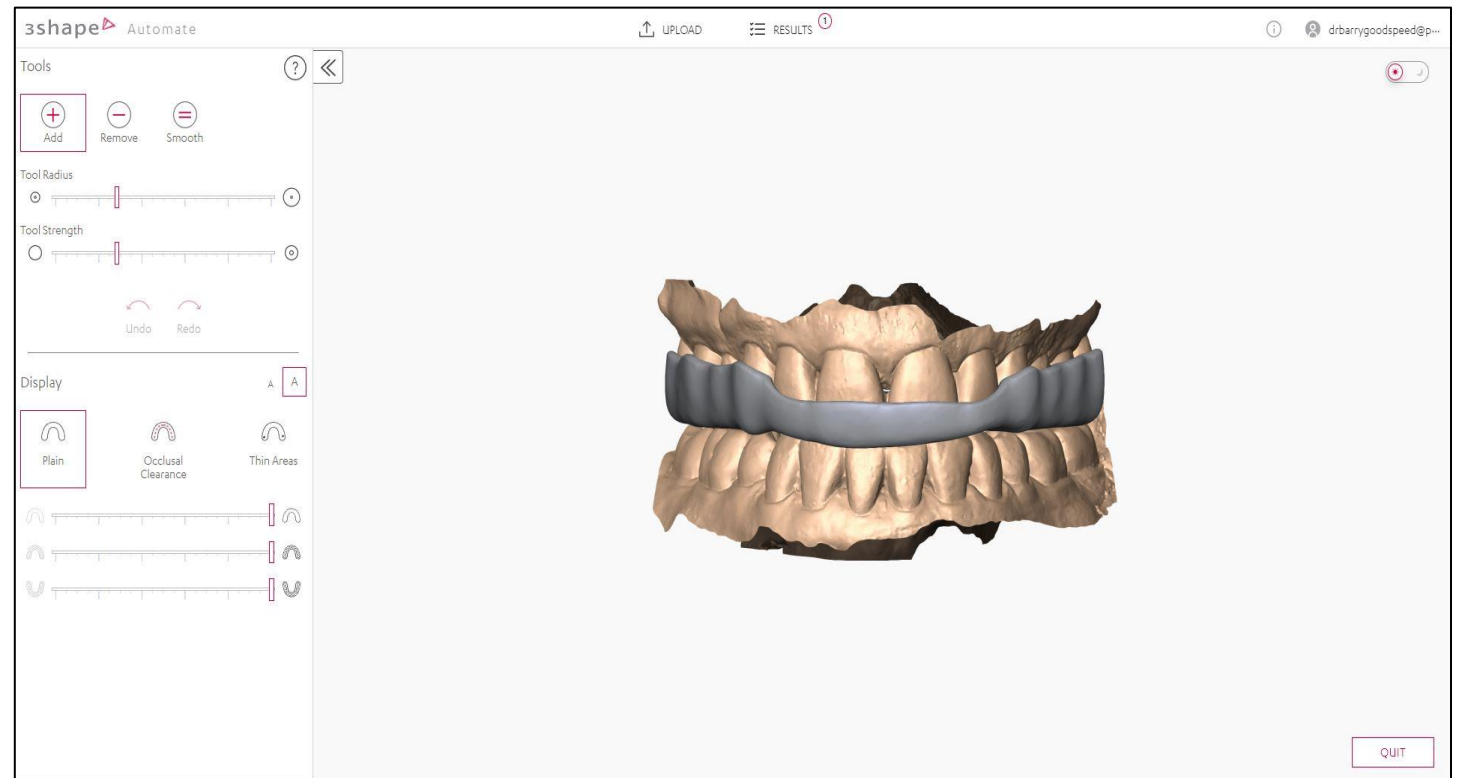


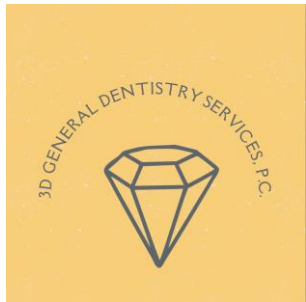


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views



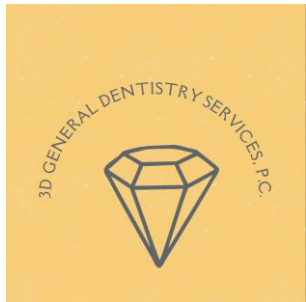


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views



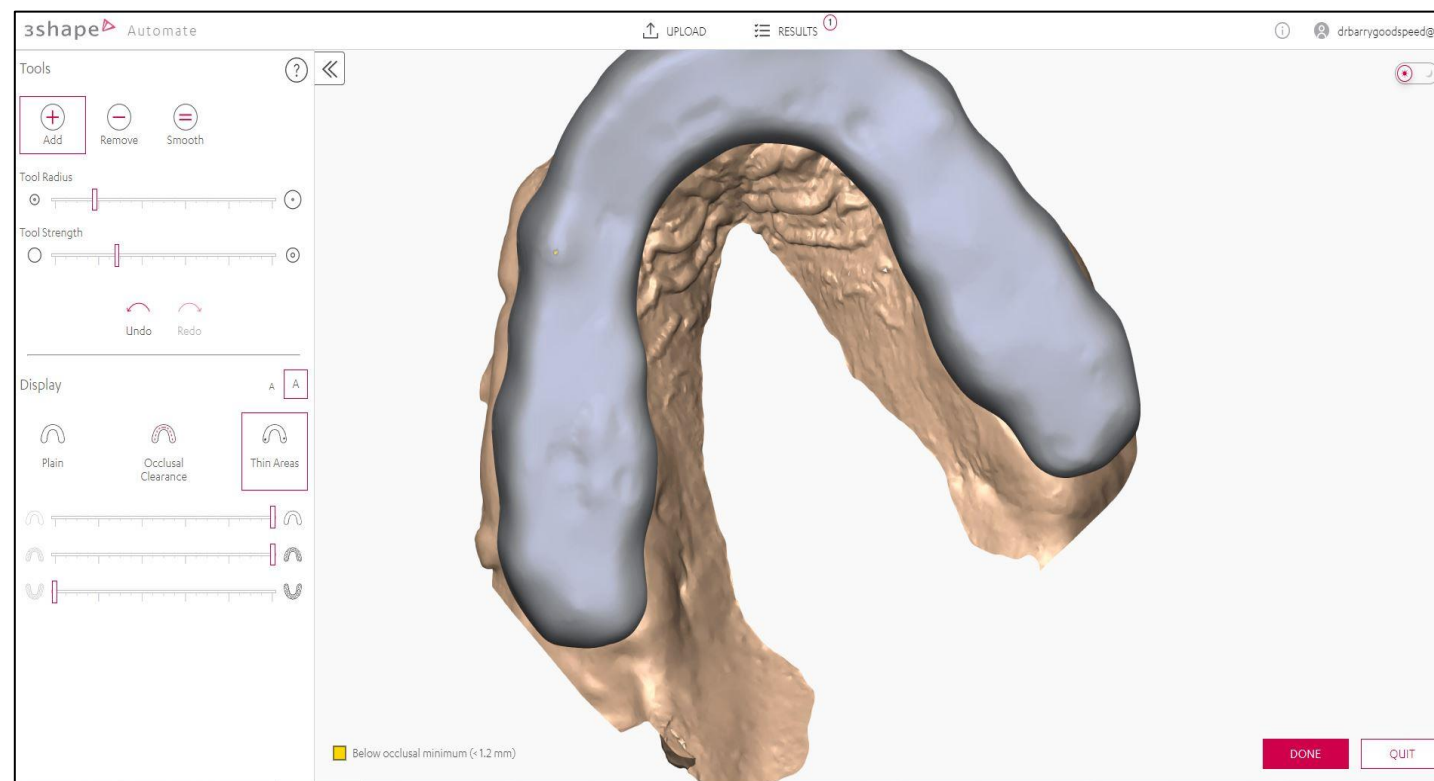


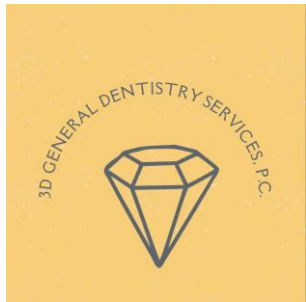
3Shape Automate

<https://automate.3shape.com/>

3D Editor Views

Occl Clearance

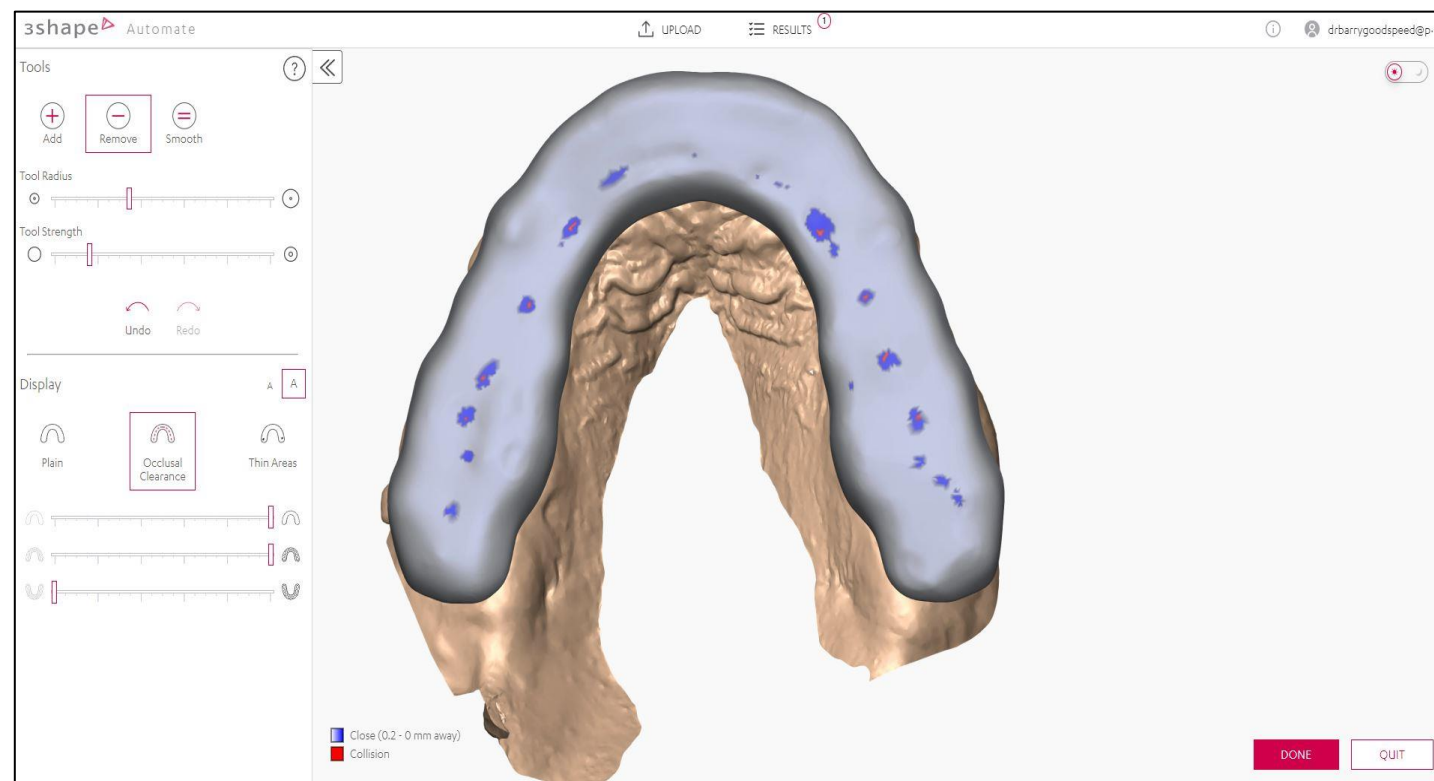


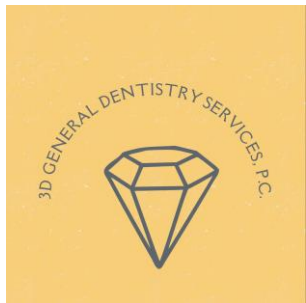


3Shape Automate

<https://automate.3shape.com/>

3D Editor Views
Occlusal Clearance





3Shape Automate

<https://automate.3shape.com/>

Review Order

3shape Automate

UPLOADRESULTS

\$19.00 of your promotional credits will expire in 83 day(s)!

[Add money to continue as a customer.](#)

[Request more free trial credit. \(automate@3shape.com\)](#)

SHOW ORDERS BY FILTER

Undecided1

Last 4 hours

Last 20 days

Search

PROD.

UPLOADED

ID TAG

ORDER NAME

STATUS

NOTE

2/21/2024, 11:33:36 AM

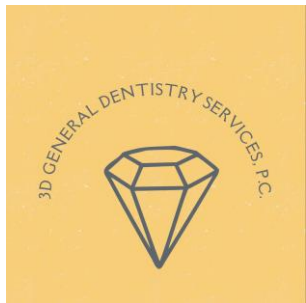
Goodspeed, Barry 2023-07-07_C15_ADA_UpperJawLowerJaw

viewed

Open bite detected.

REVIEW

Enable bulk review



3Shape Automate

<https://automate.3shape.com/>

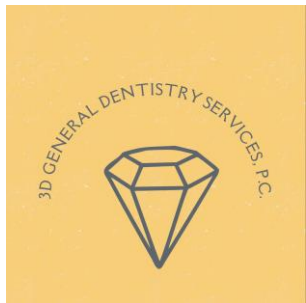
Downloaded
and
Accepted

Name	Type
 nightguard.stl	Meshmixer Document

Splint Software Comparison

SOFTWARE	REQUIREMENTS	TURNOVER TIME	COST	REVISION	EXPORT FILE	NAME EMBOSSED	MISC +	MISC -	PRE OP ADJ TIME	DELIVERY TIME (BG)	LEARNING CURVE
InLab Splint	inLab 22 Windows 10	30-40 min	\$3k (\$30k Prime Print)	spacer occlusion VDO	.sp .blc .stl	Y	Wall Thickness CO accuracy	Static occlusion. Sculpt Tool deficiencies.	15 min	5-30 min Max 5-15 min Mand	Hour+ CDOCS Videos
DS Core Create	Web	<1week	\$28.00	on request	.blc	Y on request	\$	subjective revisions	15 min	15-30 min	
Medit Splint Manual AI	Medit Web Win10 or MAC Download Account	30+ min. <5 min. refine time	Free- Export Fee?	Multi Steps PRN	.stl .stl	Y Y	Free Sculpt Tools	Static occlusion. Thickness: Ck w X Sx	15 min	10-30 min Max 5-15 min Mand	Medit Academy
3Shape Automate	Win10 or MAC (Trios Scanner)	2 D 10 min.	9.99- \$14.99	Dr can amend	.stl	? on request?	Fast Impressive		15 min	<30 min	
D3 Splint	Win10 or MAC	30++ min.	\$650.00	Multi Steps	.stl	Y Model Label	Articulator	Learning Curve***	15 min	30 min+	MANY HOURS!
Meshmixer	Win10 or MAC	<10	Free	PRN	.stl .ply	Label Emboss	Multi Uses	Learning Curve	NA	NA	Hour+



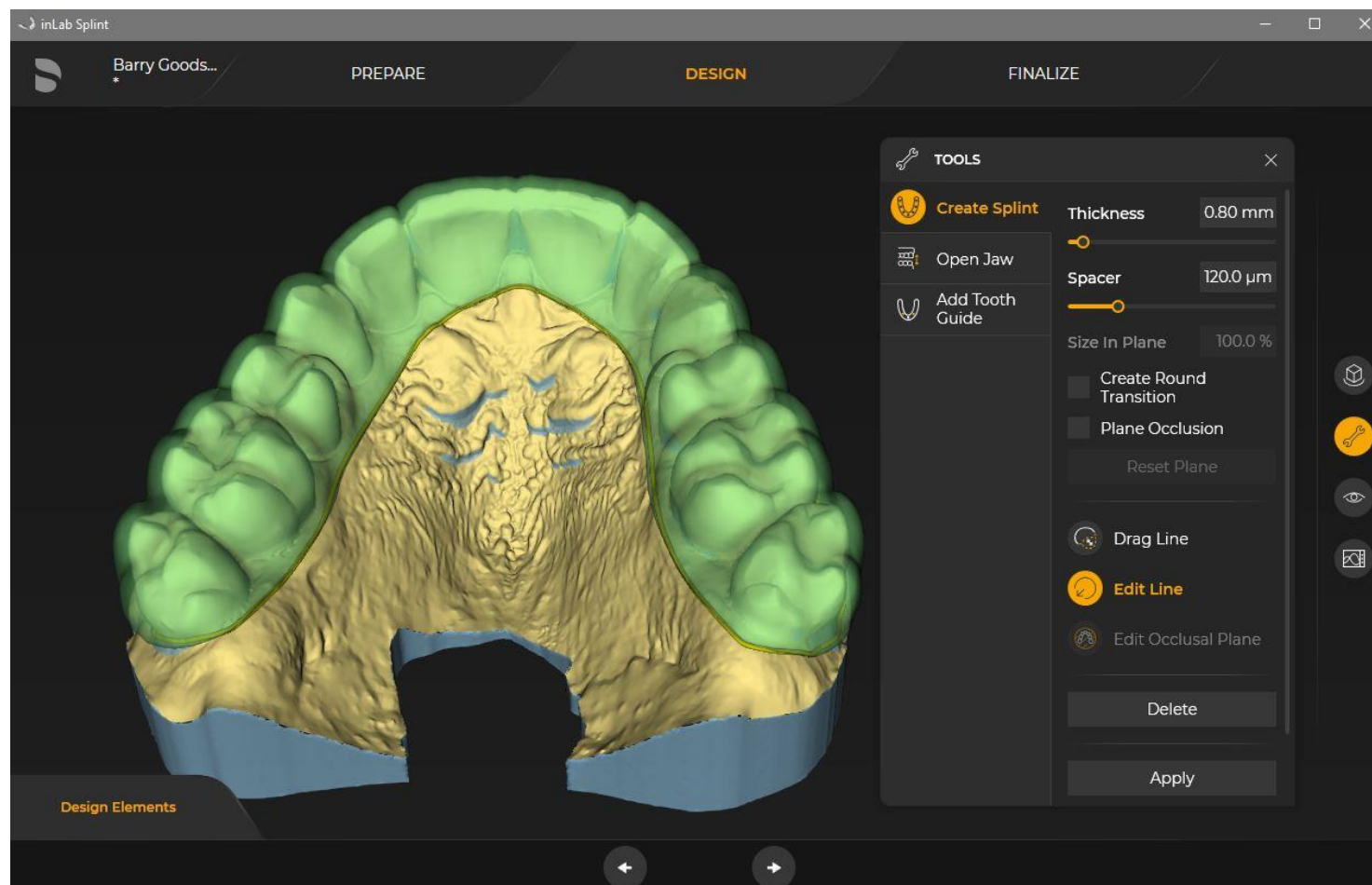


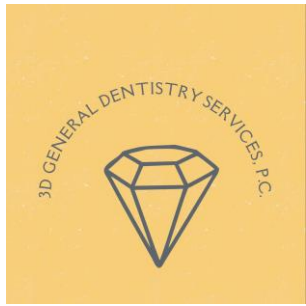
Retainer / Bleach Tray Settings

Design and Direct Print. Skip Model and Vacuform

CDOCS 9/11/2024
Dan Butterman:

“Splint ST and SF resin have now been officially approved for use as retainers. ST is designed to print as thin as 0.7, but we're testing it thinner...It is really nice to directly print retainers and essix retainers without a model and thermoforming.”





Retainer / Bleach Tray Settings

Design and Direct Print. Skip Model and Vacuform

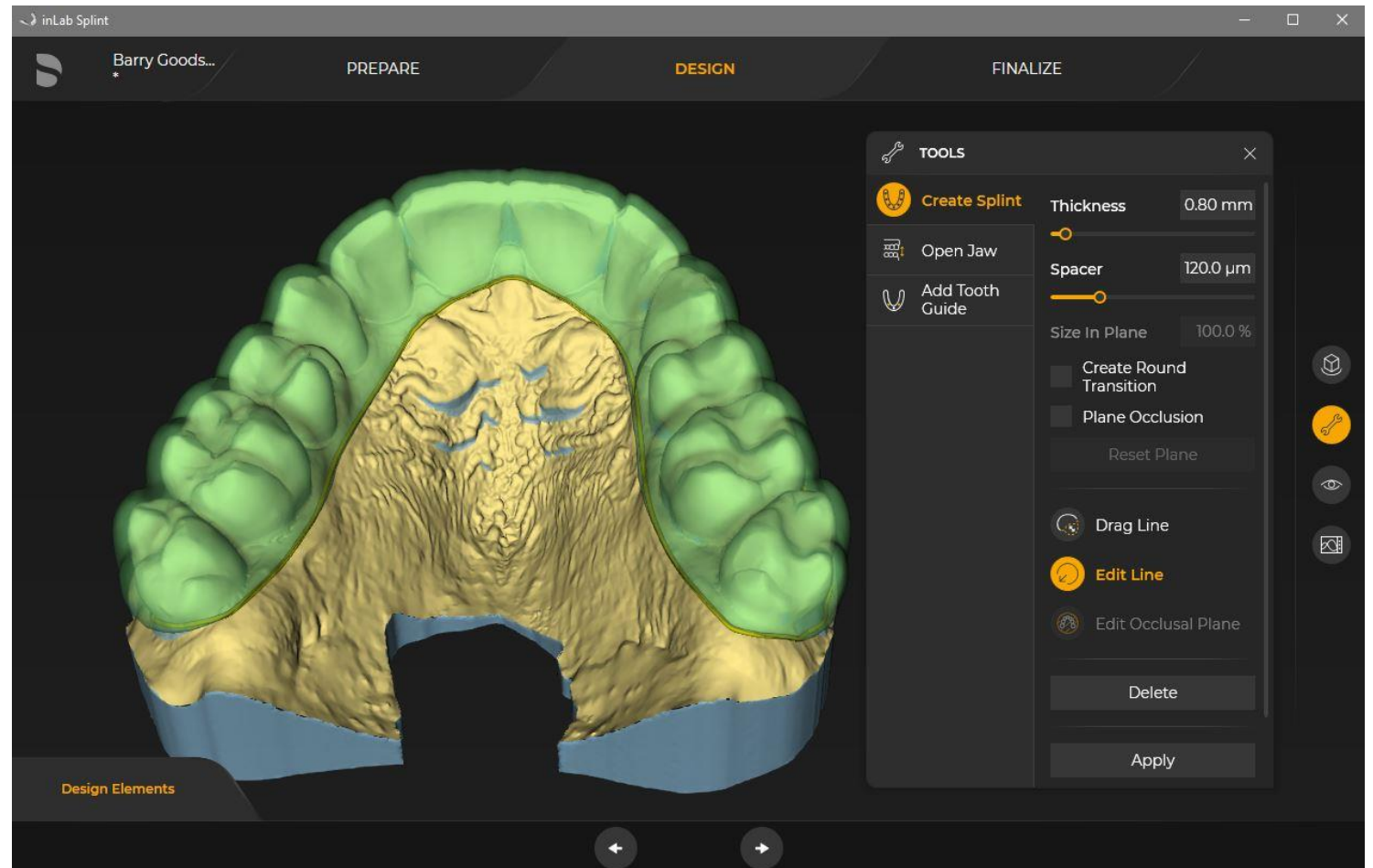
At Create Splint

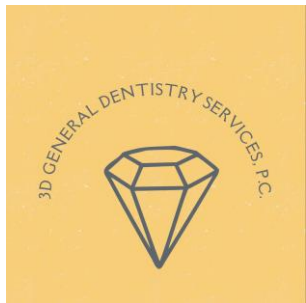
Place Outline @2 mm beyond FGM
as preferred; Scalloped border if
preferred

Min Thickness Primeprint Splint ST
= 0.8mm

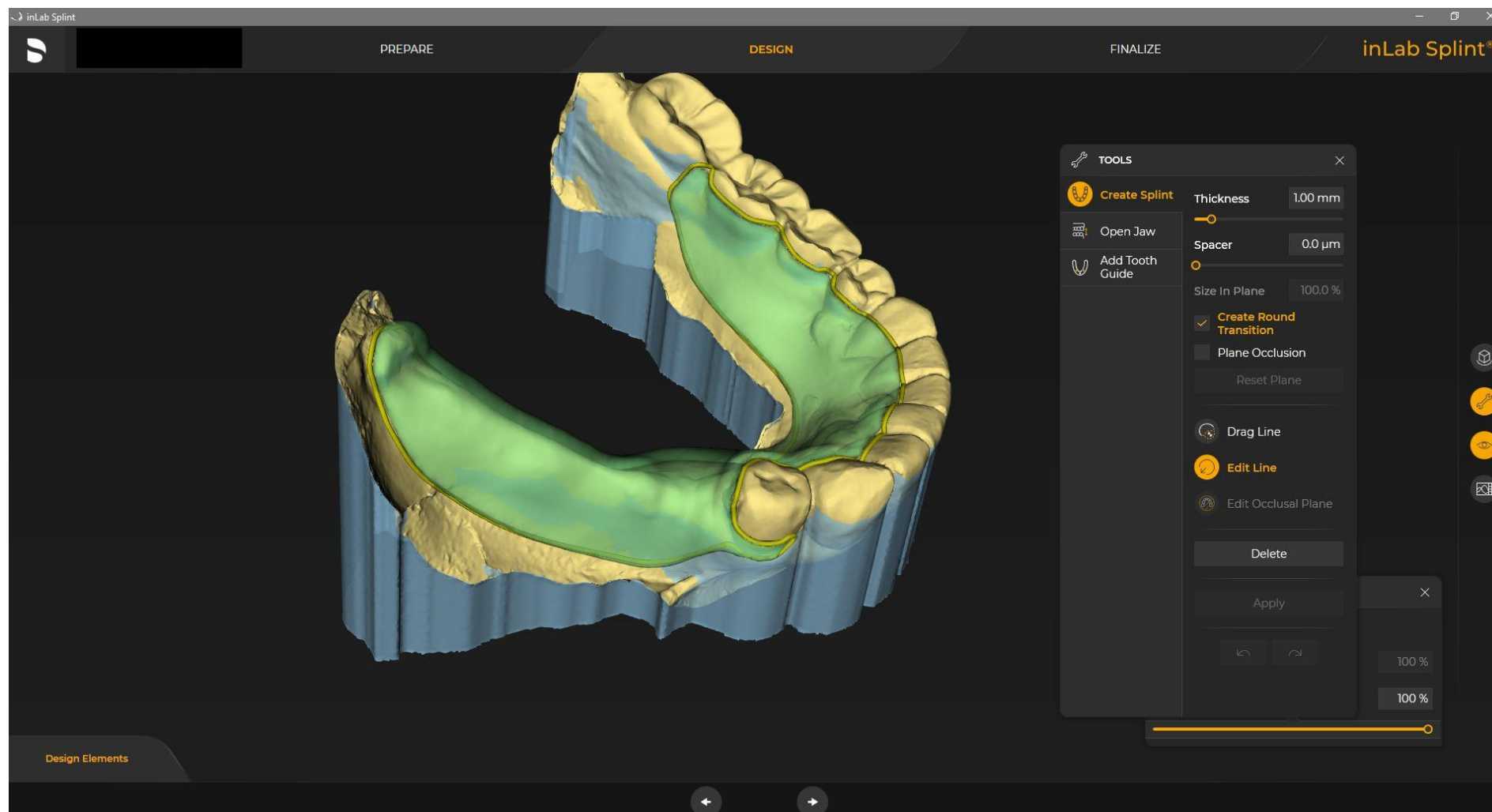
Blockout set @ 0.5?

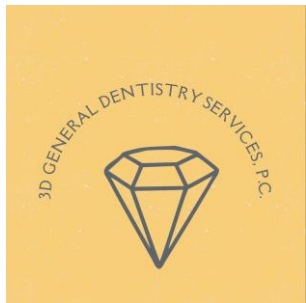
Spacer = start with 100u for
Retainer 110-120u for Bleach tray



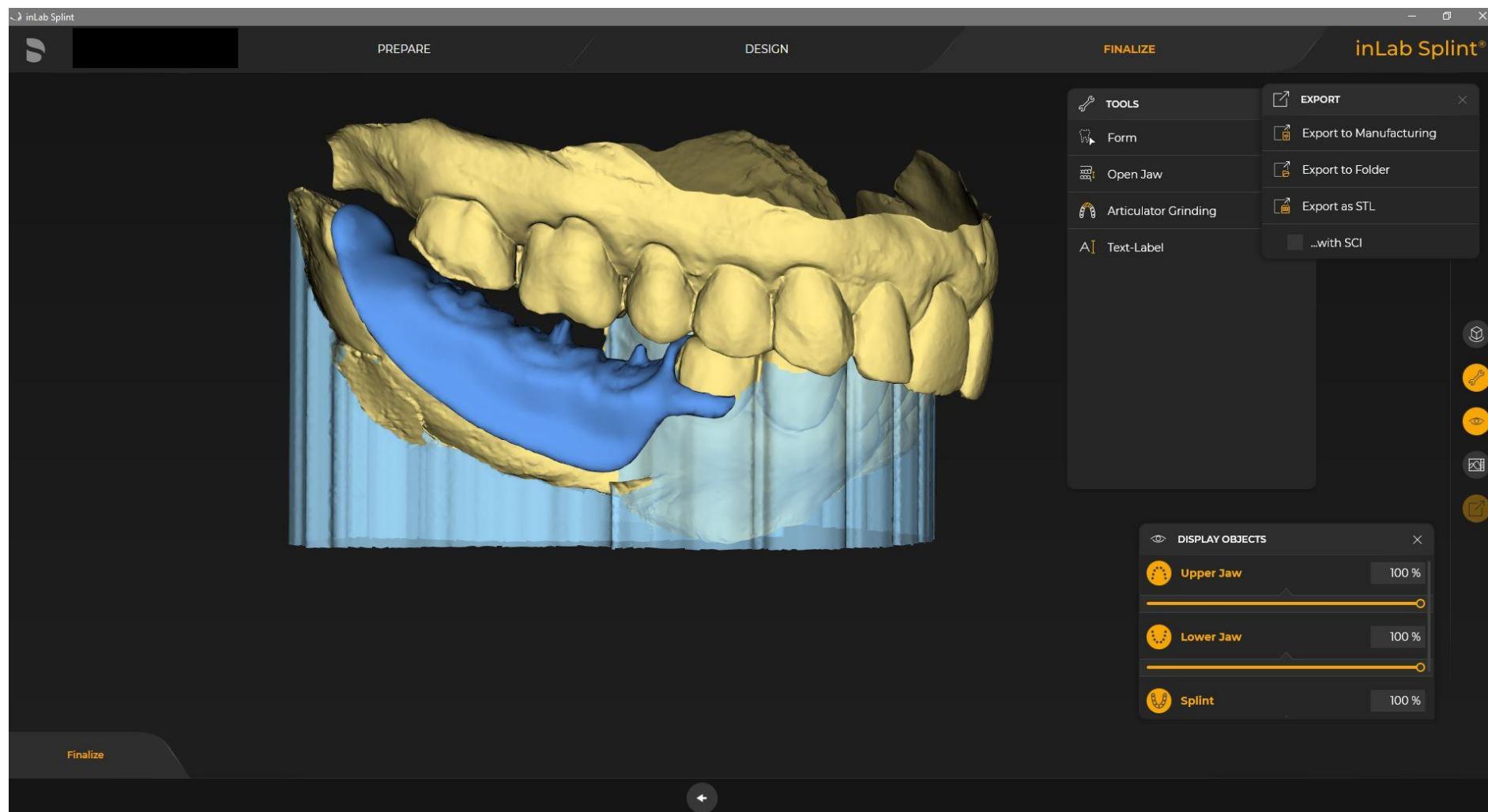


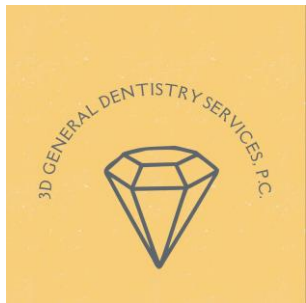
Partial Framework with Flex Resin?



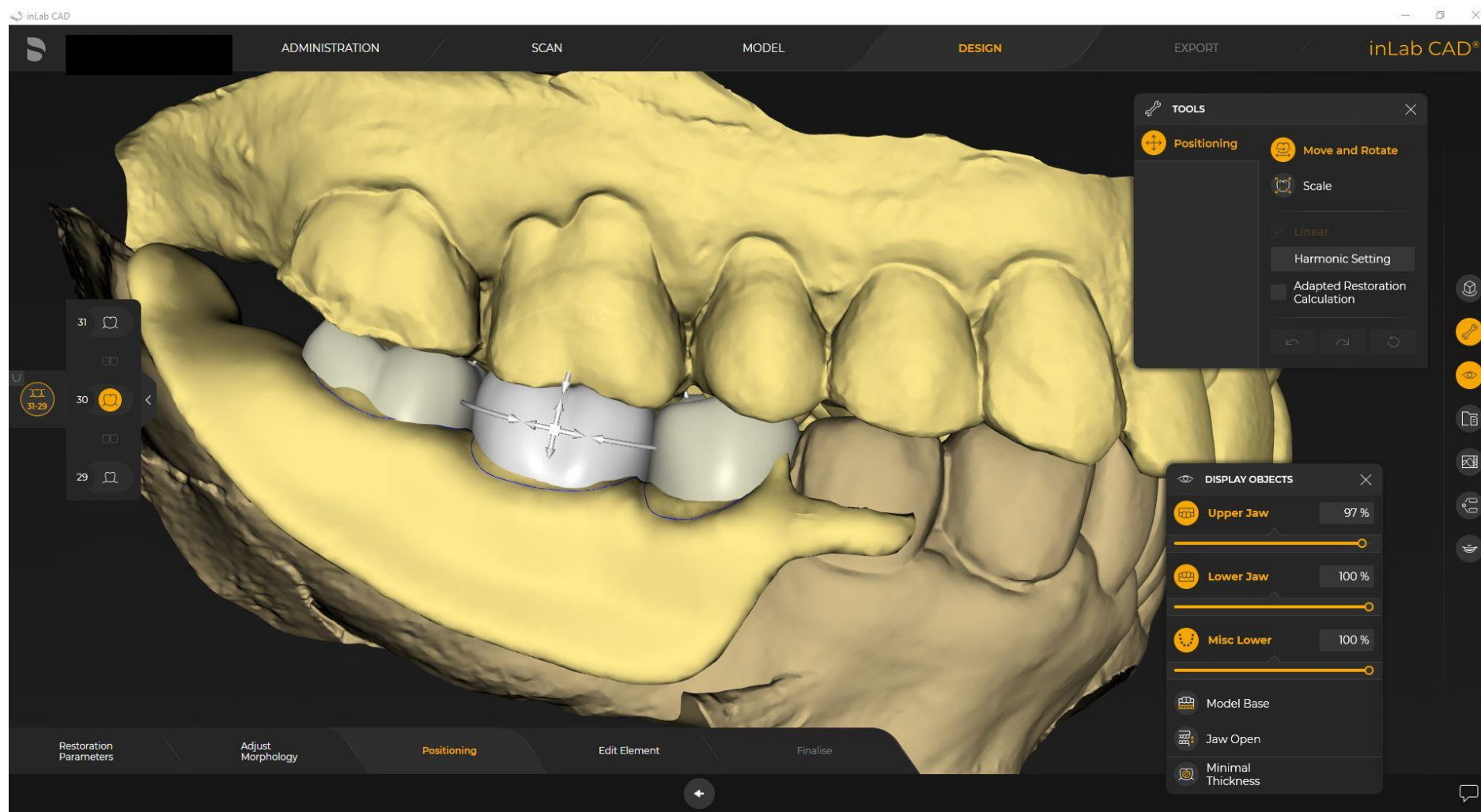


Partial Framework with Flex Resin?





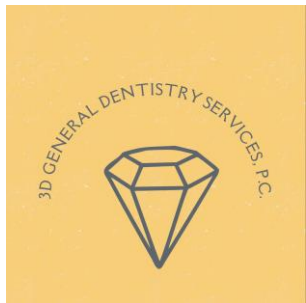
Partial Framework with Flex Resin?





Partial Framework with Flex Resin Prototype





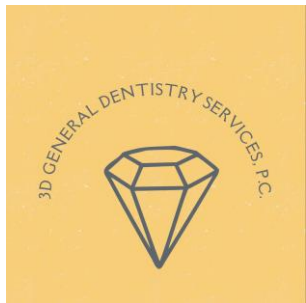
Partial Framework with Flex Resin?

- Dr'S Feedback:

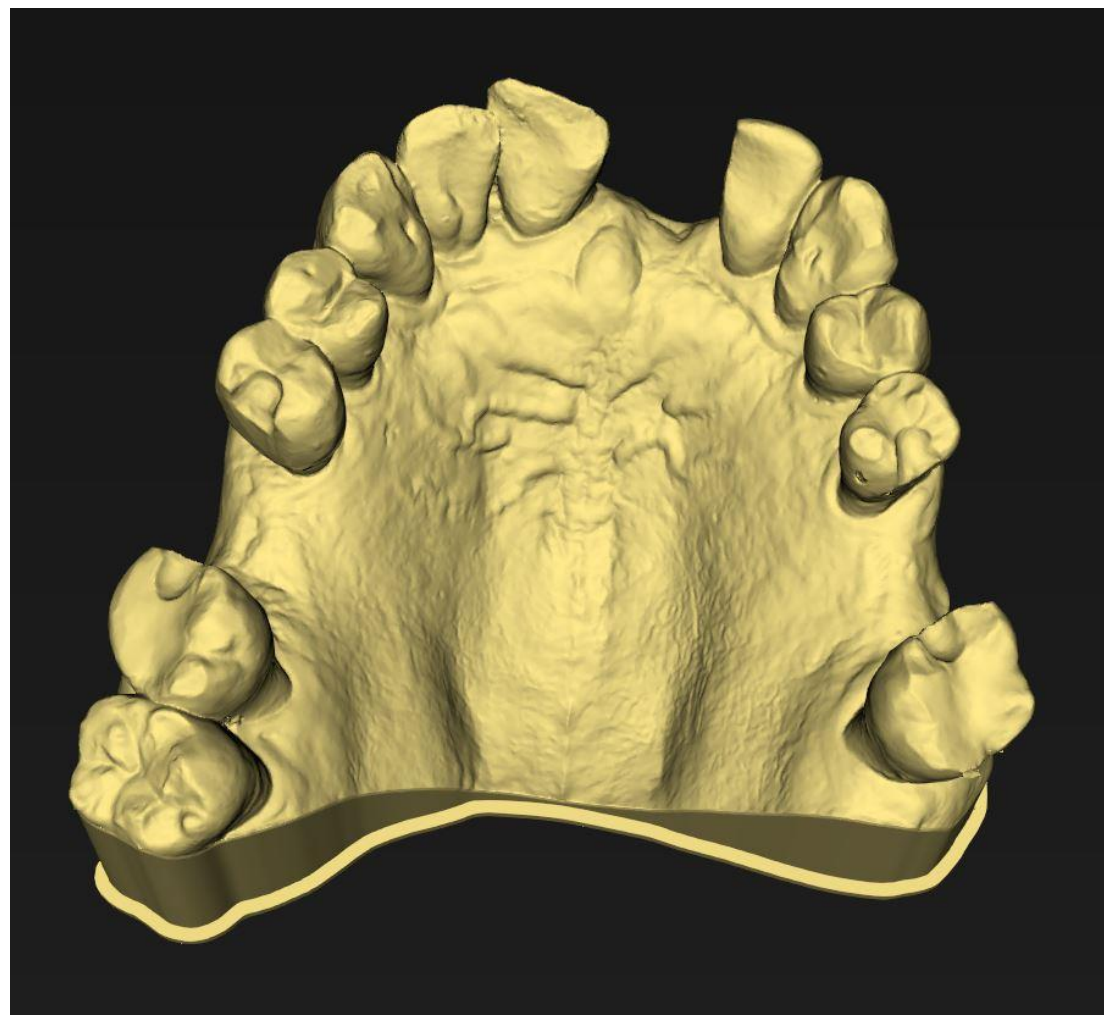
The Primeprint Splint ST Flex Partial

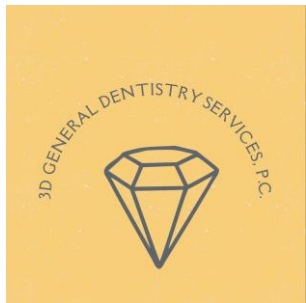
"fit better than any metal framework based partial I've ever seated."

"space between the teeth and the appliance looks pretty dark"



Partial Framework with Flex Resin?



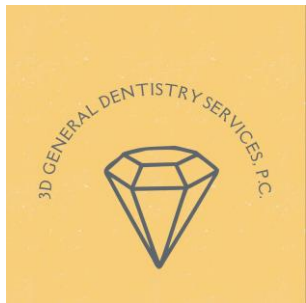


AM Repositioning Splint for Apnea

Example: Great Lakes Orthodontics
Item Number 255-041

Digital Splint would be made in MIP
without articulator grinding.





in Summary...

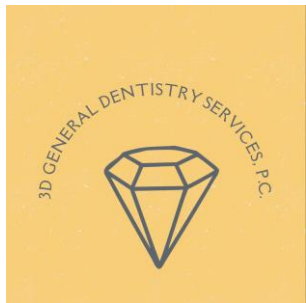
Be vigilant about your patient's **TMJ** anatomy and symptoms, particularly diagnosing their **occlusal discrepancies**.

The ability to efficiently design and **3D-Print** durable Resin Splints is well established and available now!

Sprint Ray NG2 Flex exhibited High Biaxial Flexural strength and **Primeprint Splint ST** Resin exhibited an excellent blend of Low Wear and High Biaxial Flexural strength, as per Dr. Nate Lawson's 2024 research.

Splint resins are suitable for direct print **aligners** and **retainers**.

Splint resins may be suitable for in house **partial fabrication** (further studies required).



Charges to You!

Practices should educate their staff on TMJ assessments
and

Evaluate and research their need for in house manufacturing of splints.

Thank you for your attention!

Barry E. Goodspeed, DDS

3D General Dentistry Services, P.C.

drbarrygoodspeed@protonmail.com

3DGDServices.com

205-907-1400

