Approximating Surface Matrix Band for Dentist to Use for Patients

Project Page

Date: October 26th, 2025 - November 1st, 2025

Client: Dr. Donald Tipple
Advisor: Prof. Beth Meyerand
Team:

Roshan Patel - rgpatel3@wisc.edu (Team Leader)

Keleous Lange - krlange@wisc.edu (Communicator & Co-BPAG)

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Joseph Koch - jmkoch7@wisc.edu (BSAC)

Problem statement

Surface matrix bands are devices used by dentists to separate adjacent teeth during restorations of interproximal cavities (cavities found in-between two teeth). The matrix band serves to support the restoration material, to provide shape and contour to the tooth being restored, and to protect the adjacent tooth. Ideally, the width of the space between the two adjacent teeth is just large enough to fit one matrix band in order to ensure close proximal contact area, which prevents food impaction and decay. In the case of two cavities on two adjacent teeth, this process is tedious, as the dentist must complete the process from start to finish for each adjacent tooth individually. The goal of this project is to create a dental matrix band that effectively partitions adjacent teeth for more efficient tooth restoration procedures on interproximal cavities by making it possible to complete two adjacent restorations simultaneously.

Brief status update

The team has received the material and has planned out watercutting procedures for fabrication.

Summary of weekly team member design accomplishments

- Roshan Patel
    - Waterjet file creation for fabrication
    - Imported and cleaned SolidWorks model for waterjet
- Keleous Lange
    -
- Tanya Predko
    - Prepared a show and tell script
    - Met with the team to discuss fabrication
- Joseph Koch
    - Made water jet file
    - Iterated designs
    - Started mold form

Difficulties / advice requests

There are no difficulties at this time.

Current design

N/A

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
Category 1										
									$0.00	
									$0.00	
Category 2										
									$0.00	
									$0.00	
								TOTAL:	**$0.00**	

Major team goals for the next week

1. Cut out first prototype
2. Finalize ideas for shaping post cut

Next week's individual goals

- Roshan Patel
    - Cut out the prototype from the stainless steel sheet
- Keleous Lange
    -
- Tanya Predko
    - Begin the fabrication process
    - Create a testing protocol
- Joseph Koch
    - Cut prototype
    - Print mold

Timeline

Task	September				October				November					December	
	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13
Project R&D															
Empathize	X														
Background…															
Prototyping															
Testings															
Deliverables															
Progress Reports	X	X	X	X	X	X	X								
Prelim presentation						X									
Final Poster															
Meetings															
Client															
Advisor	X	X	X	X	X	X	X								
Website															
Update	X	X	X	X	X	X	X								

Filled boxes = projected timeline
X = task was worked on or completed

Previous week's goals and accomplishments

- Ordered and received materials
- Finalized SolidWorks and protomax layout files for fabrication

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Roshan Patel	10/30/2025	- Created Protomax layout file for use on the waterjet - Prepare for show and tell	3 1	4	20
Keleous Lange	10/30/2025	-			16.5
Tanya Predko	10/30/2025	- Prepared for show and tell	1	1	22.5
Joseph Koch	10/30/2025	-			17