Approximating Surface Matrix Band for Dentist to Use for Patients

Project Page

Date: September 19th, 2024 - September 25th, 2024

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 is conducting further background research into the device and working on the design matrix as well as the preliminary presentation.

Summary of weekly team member design accomplishments

- Roshan Patel
    - Worked on the design matrix
    - Analyzed what issues need to be addressed from the last group's design
- Keleous Lange
    - Worked on the design matrix
    - Discussed fabrication techniques for newer designs
- Tanya Predko
    - Brainstormed design ideas; came up with altered “butterfly” design.
    - Worked on the design matrix.
    - Looked over previous semesters’ reports.
    - Met with the team to discuss design ideas over Zoom.
- Joseph Koch
    - Presented potential design ideas
    - Worked on design matrix
    - SolidWorks model

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. Finalize the design matrix
2. Obtain props from the client for use in the preliminary presentation
3. Complete the preliminary presentation
4. Practice/Present the presentation

Next week's individual goals

- Roshan Patel
    - Work on the preliminary presentation
    - Finish design matrix
- Keleous Lange
    - Do more background research on competing designs
    - Work on preliminary presentation
- Tanya Predko
    - Pick up supplies/props provided by the client.
    - Complete assigned portions of the preliminary presentation.
    - Complete assigned portions of the design matrix.
    - Meet with the team to rehearse the presentation.
- Joseph Koch
    - Finish SolidWorks models and refine dimensions
    - Work on preliminary presentation
    - Finish design matrix

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														
Prelim presentation															
Final Poster															
Meetings															

Client															
Advisor	X														
Website															
Update	X														

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

Previous week's goals and accomplishments

- Completed the PDS

Activities

Name	**Date**	**Activity**	**Time (h)**	**Week Total (h)**	**Sem. Total (h)**
Roshan Patel	9/25/2025	- Worked on the decision matrix and designs.	3	3	11
Keleous Lange	9/25/2025	- Worked on the decision matrix and designs.	3	3	9
Tanya Predko	9/25/2025	- Worked on the design matrix with the team - Came up with one design idea - Reviewed previous semesters' designs and current devices on the market	1 1 1	3	11
Joseph Koch	9/25/2025	- Design matrix - Made new design	2 1	3	9