Approximating Dental Matrix Band for Dentist to Use for Patients

Project Page

Date: April 5th, 2026 - April 9th, 2026

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

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

Anya Hadim - hadim@wisc.edu (Communicator)

Keleous Lange - krlange@wisc.edu (BPAG)

Tanya Predko - tpredko@wisc.edu (BWIG)

Joseph Koch - jmkoch7@wisc.edu (BSAC)

Problem statement

Dental 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

Dr. Williams is still having trouble getting the laser cutter to fabricate a usable matrix. The team is looking towards other options, like manually cutting the matrix, in order to start final testing. Testing on currently used matrices will begin this Friday to allow for comparison.

Summary of weekly team member design accomplishments

- Roshan Patel
    - Testing prep
    - Executive summary
- Anya Hadim
    - Testing preparation
    - Executive summary
    - Timing of the filling procedure
- Keleous Lange
    - Testing preparation
    - Executive summary
    - Timing of the filling procedure
- Tanya Predko
    - Testing preparation
    - Executive summary
    - Timing of the filling procedure
- Joseph Koch
    - Testing preparation
    - Executive summary
    - Timing of the filling procedure

Difficulties / advice requests

We've run into issues fabricating the device using a laser cutter. As we approach the end of the semester, we will be pivoting towards manually cutting out the matrices for testing.

Current design

N/A

Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Date	#	Cost Each	Total	Link
Category 1: Testing Materials									
Stainless Steel sheet	316 Stainless Steel Shim Stock	McMaster Carr	2317 K51	McMaster Carr	11/07	1	22.55	$22.55	https://www.mcmaster.com/2317K51/
Brass sheet	260 Brass shim	McMaster	3828	McMas	03/09	1	19.53	$19.53	

	stock	Carr	271	ter Carr					
Category 2: Final Prototype									
								$0.00	
								$0.00	
							TOTAL:	**$41.90**	

Major team goals for the next week

1. Test the matrices
2. Fabricate the final design for the semester
3. Meet with Dr. Tipple to time more fillings and measure the force of removal of the matrix band

Next week's individual goals

- Roshan Patel
    - Help with manual cutting of the matrix
    - Begin testing
    - Meet with Dr. Tipple to time fillings
    - Measure the force of removal of the matrix band after a fill
- Anya Hadim
    - Help with manual cutting of the matrix
    - Begin testing
    - Meet with Dr. Tipple to time fillings
    - Measure the force of removal of the matrix band after a fill
- Keleous Lange
    - Help with manual cutting of the matrix
    - Begin testing
    - Meet with Dr. Tipple to time fillings
- Tanya Predko
    - Help with manual cutting of the matrix
    - Begin testing
    - Meet with Dr. Tipple to time fillings
- Joseph Koch
    - Help with manual cutting of the matrix
    - Begin testing
    - Meet with Dr. Tipple to time fillings
    - Measure the force of removal of the matrix band after a fill

Timeline

Task	February				March				April					May	
	6	13	20	27	6	13	20	27	3	10	17	24	3	1	8
Project R&D															
Empathize															
Background…															
Prototyping															
Testings															
Deliverables															
Progress Reports															
Prelim presentation															
Final Poster															
Meetings															
Client															
Advisor															
Website															
Update															

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

Previous week's goals and accomplishments

- N/A