

Graduated Bowman Probes

Date: September 25 to October 1, 2026

Client: Dr. James Law

Advisor: Professor Wally Block

Team:

Neel Srinivasan nsrinivasan8@wisc.edu (Team Leader)

Caden Robinson carobinson5@wisc.edu (BPAG)

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Problem Statement

Bowman probes are the standard instrument used in interrogation of the nasolacrimal (tear duct) system in Ophthalmology. They are available in various sizes and provide tactile feedback to the surgeon when probing the canalicular/nasolacrimal system, allowing them to assess for strictures, discontinuities, obstruction, or other abnormality within its lumen. Probing is typically performed prior to the passage of implants such as nasolacrimal stents (eg. Crawford, Lacriflow, Nunchucku, Monoka), to confirm patency of the nasolacrimal system. Available probes on the market do not have any markings on them which may allow the surgeon to make measurements to points within the canalicular/nasolacrimal lumen (eg. a stricture at 30 mm distal to the punctum), which can be helpful in correlating with imaging findings, or for accurate clinical documentation and therefore inform management of nasolacrimal pathologies. We propose the development of such a stent with inscribed bands corresponding to millimeter markings which may be referenced during canalicular or nasolacrimal probing.

Brief Status Update

This week the team has completed the preliminary presentation slides and will deliver the presentation Friday, October 2nd. The team has also met with Mr. Schumacher to receive initial prototypes of the graduated bowman's probe. In this meeting, we spoke about pricing, potential improvements to the probes, and future steps. The team also will work on and complete the preliminary report with a summary of our findings and work so far, along with future plans.

Summary of Weekly Team Member Design Accomplishments

- Team:
 - Received initial prototypes of graduated Bowman's probes from Mr. Schumacher of Schumacher Machinery LLC
 - Met as a team to plan, work on, and practice preliminary presentation
 - Planned testing protocols and discussed potential fabrication protocols

- Neel Srinivasan:
 - Worked on preliminary presentation with team
 - Met with Mr. Schumacher to receive probes and speak about desired probe features along with potential prices

- Caden Robinson:
 - Completed preliminary presentation with team
 - Researched material and fabrication techniques for the soft tissue mimic

- Caleb White:
 - Worked on preliminary presentation with team
 - Met with a graduate student in my lab to discuss some bioprinting options for the lacrimal phantom

- Kenneth Sun:
 - Worked on preliminary presentation
 - Developed proposed improvements for the graduated probes testing protocols from last semester

- Sudhi Chavadam:
 - Printed out scaled model of the nasolacrimal system to assess 3D printed resin elasticity and similarity to anatomical tissue
 - Worked on preliminary presentation with team

Weekly/Ongoing Difficulties

N/A

Upcoming Team and Individual Goals

- Team:
 - Complete preliminary report
 - Deliver preliminary presentation

- Neel Srinivasan:
 - Begin probe/nonphantom testing plans (uniformity, autoclave, uniformity, accelerated life)
 - Meet with team and work on preliminary report

- Caden Robinson:
 - Crest initial soft tissue mimic prototype
 - Finish preliminary report

- Caleb White:
 - Work on preliminary report
 - Receive test phantom from graduate student in my lab and discuss further involvement in this process

- Kenneth Sun:
 - Begin refining phantom tests - generate specific ideas for our concepts
 - Revise SOP for old Probe tests

- Sudhi Chavadam:
 - Create 1:1 model with different filaments
 - Continue working on biomaterial research and meet with campus resources to assess potential internal coating methods

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Meet with client	Sep 11, 2026	All	✓	✓
Product Design Specification	Sep 18, 2026	All	✓	✓
Preliminary Presentations	Oct 2, 2026	All	✓	
Preliminary Deliverables	Oct 7, 2026	All		
Show and Tell	Oct 30, 2026	All		
Poster Presentations	Dec 4, 2026	All		
Final Deliverables	Dec 9, 2026	All		

Expenses

Item	Description	Manufacturer	Part Number	Date	QTY	Cost Each	Total	Link	
Component 1									
Component 2									
Component 3									
TOTAL:								\$0.00	