

## Ergonomic re-design of a surgical stapling device

**Client:** Dr. Amy Liepert, [liepert@surgery.wisc.edu](mailto:liepert@surgery.wisc.edu)

**Advisor:** Beth Meyerand, [memeyerand@wisc.edu](mailto:memeyerand@wisc.edu)

**Date:** 30 Mar 2017

### **Team:**

- Andrew Fugate - [afugate@wisc.edu](mailto:afugate@wisc.edu), Team Leader
- Albert Anderson - [afanderson2@wisc.edu](mailto:afanderson2@wisc.edu), Communicator
- Therese Besser - [tmbesser@wisc.edu](mailto:tmbesser@wisc.edu), BSAC
- Ellen Restyanszki, [restyanszki@wisc.edu](mailto:restyanszki@wisc.edu), BWIG & BPAG

### **Problem Statement:**

Surgical staplers have undergone many design modifications including the recent addition of powered devices. Stapling devices are used both for intestinal resections and anastomoses as well as for vascular control. The users of these devices have also changed overtime with both the increase in female surgeons as well as an aging surgeon population.

Opportunities for improvements in device design for the increasingly diversified surgeon users are multiple. This project provides the opportunity for lab based and field study investigation of the ergonomic implications for the device users as well as potential for novel design modifications and/or solutions.

### **Summary of Team Role Accomplishments**

Andrew - Looking for a printing solution, remodeling prototype

Albert -

Therese - Feedback redesign

Ellen - Reviewed feedback and compared pos/cons of our current designs

### **Summary of Design Accomplishments**

We had a meeting with Dr. Liepert, during which she provided us with valuable feedback regarding our clay prototypes. She also offered to bring us into meetings with surgeons at UW Hospital or with surgical residents to gain more feedback and test our device.

**Activities:**

Person	Task	Weekly Total	Semester Total
Andrew	<ul style="list-style-type: none"><li>Investigating affordable printing options</li></ul>	1	16
Albert	<ul style="list-style-type: none"><li></li></ul>		13.5
Therese	<ul style="list-style-type: none"><li>Dr. Liepert redesign</li></ul>	1	18
Ellen	<ul style="list-style-type: none"><li>Worked on new design matrix and comparing pros/cons of designs we have</li></ul>	1	16

**Statement of Team Goals:**

- Revisit the feedback from Dr. Liepert and make adjustments to the solidworks design
- Finalize solidworks design
- Develop a fabrication plan for the prototype

**Individual Goals:**

Andrew - Finalize the new SolidWorks layout of the redesigned prototype

Albert -

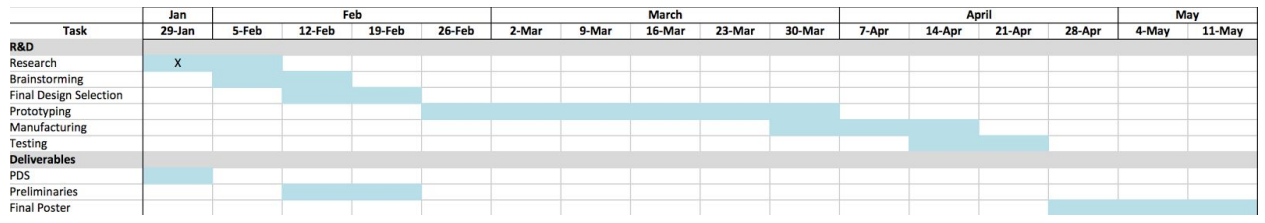
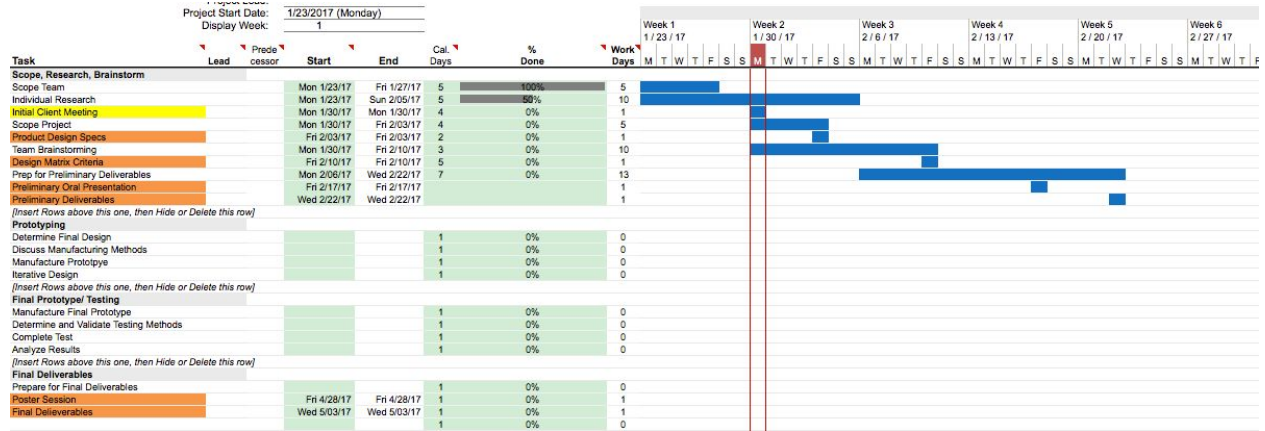
Therese - Finalize redesign plan and determine the best fabrication options

Ellen - Help edit solidworks model by end of next week

**Difficulties:**

- We foresee issues with the design of the mechanism inside the stapler.
- The 3D printer costs a lot of money based on how early it is in the semester. We need to find an affordable alternative to make a prototype to present to Dr. Liepert.
- We need to find out if it is in our scope to contact and potentially work with Ethicon. To be successful for our client we are dependant of either selling our idea or working with this company.

# Project Schedule/Timeline:



# Expenses:

Date	Store	Reason	Total Items	Purchase Total	Description
24 Feb 2017	Hobby Lobby	Prototyping	7	\$30.57	Molding clay, foam blocks, super glue, pipe cleaners