

Ergonomic re-design of a surgical stapling device

Client: Dr. Amy Liepert, liepert@surgery.wisc.edu

Advisor: Beth Meyerand, memeyerand@wisc.edu

Date: 9 March 2017 - 16 Mar 2017

Team:

- Andrew Fugate - afugate@wisc.edu, Team Leader
- Albert Anderson - afanderson2@wisc.edu, Communicator
- Therese Besser - tmbesser@wisc.edu, BSAC
- Ellen Restyanszki, 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 - Investigation into 3D printer possibilities

Albert -

Therese - Transferability considerations for the stapler, client meeting with Dr. Liepert

Ellen - Began reworking designs based off feedback

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">• 3D printer possibilities	0.5	15
Albert	<ul style="list-style-type: none">•		10.5
Therese	<ul style="list-style-type: none">• Transferability research• Client meeting	2	17
Ellen	<ul style="list-style-type: none">• Client meeting• Designing	1.5	15

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 - Print the first prototype during the week after spring break.

Albert -

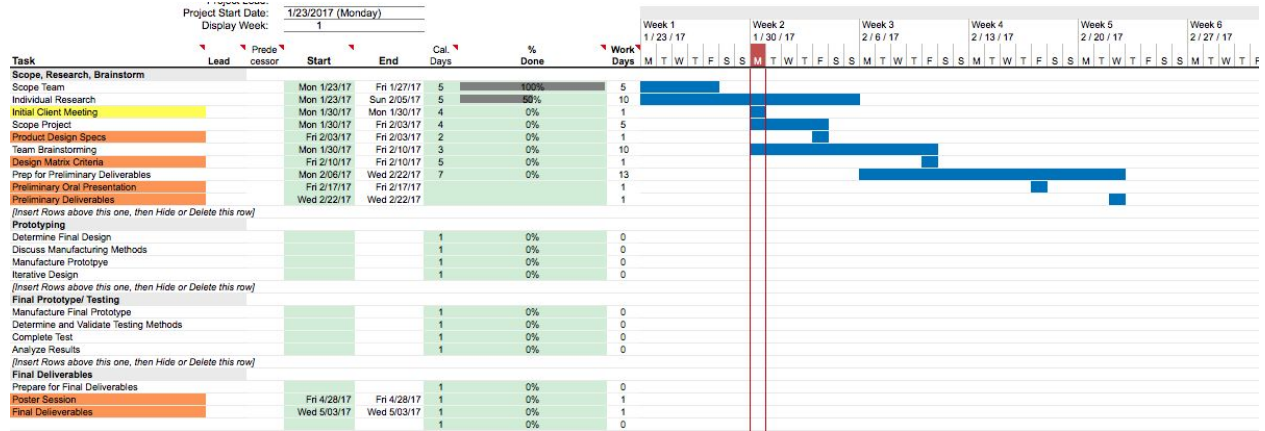
Therese - Brainstorm adjustments to the first iterations of models. Research 3D printing options.

Ellen - Complete new model by 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:



Task	Jan		Feb				March				April				May	
	29-Jan	5-Feb	12-Feb	19-Feb	26-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	7-Apr	14-Apr	21-Apr	28-Apr	4-May	11-May
R&D																
Research	X															
Brainstorming																
Final Design Selection																
Prototyping																
Manufacturing																
Testing																
Deliverables																
PDS																
Preliminaries																
Final Poster																

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