

Tibial Stent Design Team Progress Report

Client: Dr. Matthew Halanski

Advisor: Dr. Wan-Ju Li

Team: Evan Lange *elange2@wisc.edu (Team Leader)*
Karl Kabarowski *kabarowski@wisc.edu (Communicator)*
Tyler Max *tmax@wisc.edu (BSAC)*
Sarah Dicker *sdicker@wisc.edu (BWIG)*
Lida Acuna Huete *acunahuete@wisc.edu (BPAG)*

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Problem Statement

Tibia fractures are common in children, and these injuries are currently managed non-operatively using casts; however, a surgically implanted device would provide more structural stability and aid the healing of the fracture. Adult patients with this injury typically have a rigid intramedullary device implanted into their tibia bone. Unfortunately, these implants cannot be used in pediatric patients due to the presence of growth plates at the implantation site. A previous design team produced a working device that can enter the medullary canal through a hole in the side of the bone and then expand outward to stabilize the fracture, held in place by static friction against the canal wall. This device is flexible enough to fit into the canal, yet rigid enough to maintain fracture reduction, can be secured in place with screws, and can be removed from the canal when desired; however, the device is not fully fixated against the walls of the bone canal and the friction force of the device is not sufficient to prevent axial rotation within the canal. This rotation can lead to device failure resulting in unnecessary pain for the patient and extra surgery to correct the issue.

The goal of this semester is to improve the existing device by improving its fixation and adding more rigidity thereby advancing this project toward clinical use.

Last Week's Goals

- Meet with client
- Conduct background research
- Become familiar with last semester's design; possibly set up meeting with member of previous semester's design team
- Compose problem statement after meeting with client to better understand the problem
 - Complete this no later than the team meeting after the client meeting

This Week's Goals/Individual Goals

- Begin work on problem statement and PDS
- Meet with client
- Conduct more specific literature searches and research based on client needs established at meeting

This Week's Accomplishments

- First Client Meeting
- Problem Statement established
- Began work on PDS
- Design Matrix v.1 completed, but needs more design options

Project Difficulties

- Issues getting all team members together for brainstorming

Activities

Person(s)	Task	Time (hrs)	Weekly Total	Semester Total
Evan	<i>Team Role (Leader)</i>		9.5	16.5
	Weekly progress report	1.5		
	Developed next week's team goals	0.5		
	<i>Other</i>			
	Research/Develop Client Questions	1.0		
	Team Meeting/Brainstorming/Design Matrix	5.0		
	Problem Statement	1.5		
Karl	<i>Team Role (Communicator)</i>		9.0	16.0
	n/a			
	<i>Other</i>			
	Research/Develop Client Questions	1.5		
	Team Meeting - Client Questions	1.0		
	Client Meeting	1.0		
	Team Meeting/Brainstorming/Design Matrix	4.5		
	Problem Statement	1.0		
Tyler	<i>Team Role (BSAC)</i>		3.0	6.0
	n/a			
	<i>Other</i>			
	Team Meeting - Client Questions	1.0		
	Client Meeting	1.0		
	Research	1.0		
Sarah	<i>Team Role (BWIG)</i>		7.5	11.5
	Update Website	0.5		
	<i>Other</i>			
	Research/Develop Client Questions	0.5		
	Team Meeting - Client Questions	1.0		
	Client Meeting	1.0		
	Team Meeting/Brainstorming/Design Matrix	4.5		
Lida	<i>Team Role (BPAG)</i>		2.0	2.5
	n/a			
	<i>Other</i>			
	Client Meeting	1.0		
	Brainstorming	0.5		
	Research	0.5		