

# Meeting Activity Agenda

15001

**Attendees:**

- Adam Podolec: Electrical Engineer / Project Lead
- Megan Ehrhart: Senior Electrical Engineer
- Tyler Leichtenberger: Mechanical Engineer
- Noah Schadt: Mechanical Engineer / Team Facilitator
- Jared Green: Senior Mechanical Engineer
- Geni Giannotti: Biomedical Engineer / Treasurer

Current Meeting	Next Meeting
Location: MSD Area	Location: BAD Lab
Start Time: 11:00am	Start Time: 12:45pm
End Time: 2:00pm	End Time: 2:00pm
Meeting Date: Thursday 11/25/14	Meeting Date: Monday 12/1/14

**Old Business Items:**

-

**New Business Items:**

**Items Left Outstanding:**

-

**Action items – Owners / Deadline:**

- ❖ Team Tasks - All
  - Keep track of action items from the review

Geni	Megan	Tyler	Adam	Jared	Noah
Enhance attachment		Muscle-Opt. stage III	Plugging the port		Muscle-Opt. stage III
Sew and test strap	Pseudocode	Risk list - iterate	Build, Assy, Debug Plan	MSD II Project plan	Build, Assy, Debug Plan
GAD drawings (Dimensionally accurate)	Layout	Research improvement	Power ratings?	Power ratings?	Research improvement
BOM/ Purchasing - (A/R)	Software code	Upper muscle attachment	Abstract	Lower plug design	Lower plug design
IRB permission	Upper component housing	Stress analysis	ER mapping	Leg PCB housing	Upper component housing
Strap Analysis		See Jared about O-Rings	Gate Review Email	Hip Data to SVN (private)	Strap Analysis
					Action items

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## Meeting Notes:

- Team held a customer meeting
  - Electrical:
    - Sensor component housing
      - The smaller dimensions the better
      - An O-Ring is not a bad idea
        - Tyler can help Jared with the O-Ring
      - As long as the final design is a shape that can be injection molded or thermoformed
      - One team had to waterproof a 3D printed part so they covered it in Loctight to meet requirements
    - Mechanical
      - *Presented strain testing data*
      - *Presented muscle deflection limitations*
      - *Asked about full dorsiflexion customer requirement*
        - AI: add to comments that this is for clients with no spasticity
      - *Discussed that required integrated functional strain may be lower than 1in*
      - There are some average angle data
        - Jared has access to hip angle data – long Excel data in ME Research
        - Put it on our private SVN folder
      - Working Model (in MechE labs) similar to MatLAB for kinematics and dynamics
        - Make a model with the hip relative to the ground and joint angles during walking
        - Do a sensitivity analysis through the simulation during walking
          - *GG mentioned that the actual lift requirements may only be 11°*
        - The joint angle data might help, treat the body segments as rigid
        - Dr. Walter - it's called Working Model – MechE lab
        - *Since we are running out of time in MSD I can this wait?*
          - *Yes, this was taken as an action item*
        - The model can deal with height differences
          - Develop a sensitivity model
      - If we can demonstrate full integrated feasibility with the sensors and a larger muscle, then that is preferred over meeting the tank requirements since we are already not worrying about that as much
      - Walking is good way to get a lot of consecutive tests

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- *One concern about not including Plantar flexion is that the client may not be able to stretch their foot:*
  - We may want to develop a quick release on Tyler’s upper muscle attachment so that the user may take the tension off the muscle
    - The quick release will still need to hold the muscle somewhat so that it doesn’t fall down completely
    - *This could also be part of the lower attachment*
- Christmas lights might be a good example of waterproof electrical connections
- Dr.D can help Geni find the IRB documents
- Don’t change the ER but make a comment that we may not be able to reach the marginal value
- Quick Connects:
  - She likes the idea
- Closing question:
  - *Do you feel comfortable with our mitigation plan?*
    - Yes
- Discussed the Geneseo business class and workshop opportunity
  - Event: January 15, 16 and 24, 2015
  - Location: Campus House, 17 Main St, Geneseo, NY
    - Adam sent the flier to the team
    - Jared, Geni, and Adam may be available

Customer Meeting Action Items 11/25/2014					
Item #	Description	Responsible	Due Date	Close Date	Comments
CM01	Comment in the customer requirements	Noah	DDR		FT2 “does not include spasticity”
CM02	Move hip angel data to private SVN	Jared	DDR		In ME Research
CM03	Develop a Working Model with sensitivity analysis	Noah/Tyler	MSD II wk2		In MechE labs
CM04	Formalize MSD II Test plans	Noah	DDR		As outlined in Agenda
CM05	Comment Engineering Requirements	Noah	DDR		“May not be able to reach
CM06	Begin IRB permissions	Geni	MSDII		Deadline flexible
CM07	Consider easy plantar flexion release	Tyler	MSDII		Manual support too?

- Team discussed adding a manual switch to the hose – GG took a picture of the concept
- GG, ME, and NS went to the BAD Lab and worked taking AFO measurements
- Team returned for thanksgiving Pizza
- Tyler and Noah went to the BAD lab to perform Muscle Optimization Stage III testing
- Tyler and Noah to brainstorm manual mode without string

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Additional concerns identified:

- The brace is currently uncomfortable with a shoe
  - o The brace was even cutting off circulation

Action Items					
Item #	Description	Responsible	Due Date	Close Date	Comments
A001	Color correlation on the M-opt plot	Noah	DDR	IP	Make EGDE clearer
A002	Weigh the shoe for the foot-lift	Noah/Geni	DDR		Inconsistency in model
A003	Repeatability of the muscle tests	Tyler/Noah	DDR		At least three trials
A004	Modify/improve muscle attachment	Tyler	DDR		Dove tail/vertical support
A005	Pressure not flow in schematic	Megan	DDR		
A006	Pseudocode	Megan	DDR		
A007	Consider 3M rather than Velcro	Jared/Noah	DDR		For component housing
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Issues					
Item #	Description	Responsible	Open Date	Close Date	Comments
I001	The AFO could be slippery with socks	Geni	10/23	IP	Relates to A009