MSDII Testing – Muscle Corrosion Testing

Team: P15001: Active Ankle Foot Orthotic
Engineer: Tyler Leichtenberger – Mechanical Engineer

Related System: AAA- Secure Foot; ABBB- Articulate Foot

This test would help determine if the McKibbon muscle would corrode over time. The muscle chosen to be used on our AFO needs to be designed to be used for nearly infinite life. Therefore, it must be tested that the muscle and its attachments do not corrode or deteriorate over time and start to lose its function. If the muscle deteriorates, then it would not performed as needed.

Engineering Requirements

ER2- Design Failure Factor of Safety

ER4- Torque to lift foot by McKibbon air muscle

ER5- Dorsiflexion mobility with McKibbon air muscle

ER6- Number of muscles flexes untethered

Testing Plan

This test would be a relatively simple test completed over a time frame of a couple weeks to determine if the muscle would corrode. One fluid that we feel could come in contact with the AFO besides clean water is salt water. A new muscle would be constructed that could be potentially destroyed by the corrosion test. The muscle would be tested for performance before it was tested and after it was tested, determining if any performance was lost by soaking the water in salt water. This test could also be performed with slightly acidic or basic water; however, it would not need to be tested with anything extremely strong that the AFO would not come in contact with over a day's use.

Start Date: February 2015 (Phase 2)
End Date: March 2015

Budget

Equipment	Price	Quantity
Prototype McKibbon Air Muscle	-	1
Tap Water	-	1
Salt	-	1
Slight Acid or Base, if needed	-	1
Total:	-	