



For immediate release — Thursday, July 6, 2017

3D-printed prosthetic brings hope to young man in Africa

A retired University of Lethbridge kinesiology professor, an alumnus and a graduate student in kinesiology are making a huge difference in the life of a young man living in Africa after he lost both arms above the elbow following an accident.

Dr. Mary Dyck (BA '82) and Brittany Mercier, who's working on a master's degree and is an athletic therapist at the U of L's Rebound Health Centre, have been working with Sunday, a 19-year-old man who lives in a rural area of southern Nigeria. In December 2015, he sustained injuries when he used a metal pipe to retrieve a bucket from a well. As he lifted the bucket up, the pipe hit a high voltage wire above him. Both of his hands were broken and, because they failed to heal properly, both arms were eventually amputated. He also required many skin grafts, including one that covered his ankle. The graft interfered with Sunday's ability to bend his ankle, forcing him to walk on his toes.

Dyck learned about Sunday's situation from her sister and brother-in-law, who are [missionaries in the area](#) where Sunday was hospitalized. She approached Colin Pischke (BMgt '13) about 3D printing a prosthetic. Pischke, through his [Print Your Mind 3D](#) company, has been teaching high school students to make hands. Eventually, Dyck and Pischke joined [Medical Makers](#), a for-profit social enterprise that creates medical solutions by using technology to save lives, time and money. Joining Medical Makers allowed Dyck and Pischke to lead a team of medical engineers to work on the project. Phase 1 included developing a left socket, forearm and hand for Sunday. The team had no one with a therapeutic background so Mercier, who was a teaching assistant in one of Dyck's classes at the time, was brought on board. When Mercier saw a video of how Sunday walked, she and Dyck knew he could benefit from hands-on treatment with a therapist.

Dyck and Mercier travelled to Nigeria in February to meet Sunday. They brought the printed socket and arm and tested a 3D-printed Gripper Thumb Terminal Device (TD) prosthetic hand designed by two volunteers with the Enable Community Foundation. Sunday caught a glimpse of how the device could help him with daily living tasks and assist him in returning to university to resume his studies in electrical engineering.

“We were very excited to meet Sunday and test the prosthetic arm,” says Dyck. “The 3D-printed Gripper Thumb TD will enable him to grasp objects, such as a pen or toothbrush. I don’t believe he could envision doing daily tasks again without seeing our prototype prosthetic.”

During the three weeks in Nigeria, Mercier used her knowledge of athletic therapy to mobilize the scar tissue in Sunday’s ankle to allow better mobility.

“Brittany worked with Sunday every day to reduce the restrictions of the skin graft scar tissue on his mobility. The difference that the treatments made was unbelievable. The hospital there does not provide any physiotherapy. Seeing Sunday walk with an almost typical gait was one of the highlights,” says Dyck.

“Sunday was wonderful. He was compliant, optimistic and grateful for any help that could be given to him,” says Mercier. “It felt rewarding to help somebody who sustained such severe injuries but still had such an optimistic outlook.”

Since the trip in February, Dyck and Pischke, with the Medical Makers team, have worked through the modifications to redesign and print two arms for Sunday. They have received tremendous support from Ryan Cochrane, a local prosthetist at Lethbridge Orthotics and Prosthetics to ensure the fit and function will meet Sunday’s daily needs.

The prosthetics will be delivered to Sunday in July, along with a comprehensive therapy program, including videos, developed by Mercier. Through practice and experimentation, Sunday will once again be able to do many functions and regain independence.

This news release can be found online: [Hope for Sunday](#)

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