

TITANIUM RIDENTS

90% FLESH
+
10% METAL = 100% SEAL

PICTURE YOURSELF SWIMMING, RUNNING OR JUMPING WITHOUT BOTH OF YOUR LEGS, OR FIRING A WEAPON WITHOUT ALL OF YOUR FINGERS. IT'S HARD TO IMAGINE, BUT FOR TWO ACTIVE-DUTY SEALS IT IS A REALITY. BOTH OPERATORS MAY HAVE LOST PARTS OF THEMSELVES PHYSICALLY, BUT THEY HAVEN'T LOST THE WILL OR DETERMINATION TO CONTINUE DOING WHAT THEY LOVE TO DO - FIGHT FOR THEIR COUNTRY.



MC2 Sarah E. Bitter



Top: Brian Hughes cuts the SEAL's molding. Bottom: from left, Brian Hughes, Robert DeRohan, Matt Griebel, and the SO1 wait for the impression of the SEAL's leg to dry.

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Both SEALs are currently taking part in a program sponsored by the SEAL Warrior Fund and Quality of Life Plus (QL+). The goal of these groups is to create new prosthetic limbs and hands for active-duty SEALs. The project combines biomedical engineering with mechanical engineering, creating state-of-the-art, multi-purpose biomechanical prosthetic limbs.

"We believe the gains made on these men will easily provide a new insight on the development and maintenance of prosthetics for many SEALs to come," said Mark Donald, military and veteran liaison for QL+.

One of the program participants is an East Coast-based Special Warfare Operator 1st Class (SO1) and the other is a West Coast-based Chief Special Warfare Operator (SOC). Both men were specifically chosen for the program because of their determination to stay on active duty.

For SO1, his story began when he lost the function of his leg to an improvised explosive device (IED) during a July 2007 counter-terrorism mission in Iraq. Although badly injured, he refused to succumb to his injuries and did not want his SEAL career to end.

SO1 worked with doctors trying every avenue possible to save his leg, but after two long, grueling years and a series of medical tests, the only option for him was to have his leg amputated. Because of the severity of his injury, SO1's career could have been over.

"I have wanted to be a SEAL ever since I can remember and I refused to let this end my career. I battled to stay active," said SO1. "I was also told by the doctors that I would not be able to walk for a year and a half; in nine-months, not only was I walking, I was also running,"

SO1 won his fight to stay active, but is still faced with the challenges of his prior injury.

Currently, SO1 needs to carry two separate prosthetic legs with him while he is operating. He uses one for day-to-day use and land operations and a separate prosthetic for operations involving swimming.

"The prosthetic I use for swimming works well, but having one that could do both swimming and running would be great. On a positive note, when you are in the field, the most important thing is to keep your feet dry and I only have to worry about one," said SO1. "Plus, socks go a lot further."

SO1 will soon only need one prosthetic that will do both thanks to work done by Quality of Life+. Both SEALs were introduced to the program when they met Donald.

"Mark asked me if I wanted some cool stuff made for my leg and I said sure," said SO1.

While visiting California Polytechnic State University (Cal Poly), SO1 had a fiberglass mold made of his leg.

"We did this because it will give us a good design (of shape and size of his leg). We also did this because of his schedule. Creating a mold will help us ensure that when we attach the mechanisms to the leg, it fits properly," said Brian Hughes, a masters student in biomedical engineering and QL+ team member.

SOC's story is similar, although his injury was quite different. He was injured in a training accident at Camp Pendleton, Calif. in mid-December 2004 when a training charge was detonated in his hands by another platoon member. He lost his left hand down to the wrist and his right hand had multiple fractures and burns. In addition, he lost the tip of his right thumb.

"He was hospitalized for six days, but had started rehabilitation within eight-weeks," said Erika the SOC's wife. "He went through about three months of intensive rehabilitation, before he went on his



Matt Griebel, a masters student in mechanical engineering at Polytech, adjusts the tension spectra-chord, which simulates the tendons in a human hand.

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first workup in the spring 2005," she said. "He deployed in the fall that same year."

Throughout the deployment, SOC experienced a lot of pain in his hand, according to Erika. He also felt that he had to work harder and needed to make many adjustments to his daily routine, she said. After a period of adaptation, SOC learned to master his injury.

"Now, his fellow team members forget that he is even missing part of his hand because of how well he is doing," his wife said.


SOC came out to Cal Poly for a fitting for his new prosthetic and to check out the lab in June of this year. He was having trouble performing certain tasks with his current prosthetic such as; picking up a magazine case, gaining a firm grasp on a flashlight and holding a gunstock.

"Innovations on the new prosthetic will optimize his hand function leverage so he can perform those tasks a lot easier," said Nate Butler, biomedical engineering major, QL+ member.

Although these two men received the first prosthesis created by Quality of Life+, they will not be the last. New projects are scheduled to begin next year.

The QL+ team is made up of two three-man teams of graduate level students who build the specialized prosthetics. Through the course of the 2010 project, the SEAL Warrior Fund provided \$75,000 and the QL+ team donated \$100,000 to make the Cal Poly based project possible.

"The principle behind this project is to improve the quality of life for operators wounded in the line of duty," said Donald.

The two SEALs visited Cal Poly San Luis Obispo at different times throughout 2010 to observe the lab and have their prosthetic measurements taken. The first prototypes of their prosthetics are scheduled to be completed by early next year. 

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- East Coast Navy SEAL

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