

# Muilenburg Prosthetics and Orthotics REVIEW

## MPO Patient Receives State-of-the-Art DynamicArm

Dario Talamantes, 60, joins an elite group of upper extremity amputees to wear the most advanced prosthesis commercially available – the DynamicArm® from Otto Bock. And his prosthetist, Ted Muilenburg, CP, FAAOP, is among only a handful of practitioners in the country who are certified to fit the DynamicArm.

“This is a very high-tech elbow, and the first Otto Bock elbow to have a microprocessor control its movements,” said Ted. “Its microprocessor communication system results in a much faster transfer of information that commands the arm to move. It utilizes a centralized bus system to process communication to as many as four microcontrollers for movement. Unique to this system is the Bluetooth™ USB adapter link enabling wireless communication between the arm and the computer for programming.”

In other Otto Bock upper extremity myoelectric devices, the wrists rotate, and the hands open and close. But with the technology used in the DynamicArm, there is power in the elbow, making movements quicker and easier.

Dario’s fitting took place at a three-day seminar attended by four other practitioners at Otto Bock’s North American headquarters in Minneapolis. The seminar was only the second offered by Otto Bock to North American practitioners. Ted worked with a laptop computer to calibrate the software in the DynamicArm to match Dario’s muscle movement. “The software provides nine different programs and a customizing program, to give even greater control to the user,” Ted said. “Electrodes inside the socket



With his new DynamicArm, Dario is able to work his 10-acre farm in Brenham — he drives his tractor, mends fences, and carries out other farm-related activities. He also likes to come to Houston shopping!

of Dario’s prosthesis contact his skin just over his biceps and triceps that used to move his elbow. Now, when he flexes these muscles, the electrical impulses they produce are picked up by the electrodes that in turn, now control his prosthetic elbow and hand.”

“It’s a very smooth operation and I appreciate the way it works,” Ted said.

Dario became acquainted with the Muilenburg Prosthetics and Orthotics team while a patient at TIRR in 2005. He was first fitted with an Otto Bock ErgoArm. But as Ted Muilenburg explained, Dario’s lifestyle, his limb length (just above the elbow), and his experience with the ErgoArm made him a good candidate for Otto Bock’s DynamicArm with myoelectric hand and suction socket for suspension.

“The difference is like day and night,” Dario said. “Before, I couldn’t grab things. Now, I can reach out and pick up anything. I’m still getting used to it and learning more about it, but so far, it is easier to use.”

Dario is able to work his 10-acre farm in Brenham, about 70 miles west of Houston. He drives his tractor, mends fences, and carries out other farm-related activities.

Dario lost his arm through a work-related accident when he was employed by Exxon Mobile. Dario was working by himself, opening up a gas well near Anderson, 80 miles north of Houston, when it unexplainably blew. His arm was severed immediately, but Dario managed to get to his truck and drive a mile when he saw a Grimes County deputy. The deputy applied a tourniquet and called for medical help.

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Shawn Swanson, OTR/L, of Otto Bock Health Care's upper-extremity team, makes adjustments to Dario's DynamicArm.

### **Dario, from page 1**

Dario was airlifted to Memorial Hermann Hospital where he underwent surgery. He then was transferred to TIRR for rehabilitation.

"I thought it was the end of me," Dario recalled of those first weeks after the accident. "I didn't want to leave the house. My grandchildren were scared. But I got over it, especially when I went to TIRR and saw so many others who were worse off than me."

Things got better for Dario after he received the ErgoArm. He was more confident when he went to public places and was able to talk about his prosthesis when asked questions. "It's a small town and everybody knew about the accident," he said. "Sometimes people I didn't even know came up to me and wanted to see my arm."

## **DynamicArm® Delivers Flexibility, Speed and Heavy Lift Capability**

The DynamicArm® by Otto Bock is a new myoelectric prosthesis for transhumeral amputees, and is now available on a limited basis in the North American market.

The DynamicArm offers benefits to upper extremity amputees including a greater range of motion, faster response time to commands, and closely mimics natural arm movements, as well as allowing for quick, exact positioning of the hand, even with heavy objects.

Movements of the elbow, wrist, and hand are controlled through electrodes that are placed on the skin over muscle, which the patient can still control with contraction. When these muscles are flexed, they produce electrical impulses that are sensed by the electrodes that tell the components which way and how fast to move. These movements are then controlled by preset software set to the patient's specific needs, resulting in higher function and greater independence for the amputee. Even when the arm is turned off, or the battery is low, the elbow can be passively flexed and extended. This movement is aided by the same

Because of his improved range of motion and grasping abilities, Dario will probably attract less attention from strangers now. "I'm glad I have the DynamicArm," he said. "It's helped a lot."

In addition to the DynamicArm, Ted is expert in other types of myoelectric and conventionally-controlled prostheses. He frequently attends educational programs to keep updated in the latest technological advancements. Ted states that every amputee has a different residual limb, and will use their prosthesis in different ways. "As with any upper or lower prosthesis, the practitioners at Muilenburg evaluate each person's individual situation to select the most beneficial device for them," he said.



When the muscles are flexed, electrical impulses are produced that are sensed by the electrodes that tell the components which way and how fast to move. Ted uses preset software set to the movements to Dario's specific needs, resulting in higher function and greater independence.



Dario with Suzanne Krenek, OTR, at Memorial Hermann TIRR.

counterbalance as in the Otto Bock ErgoArm, and it can be locked in position using a standard cable release.

It exceeds the performance of other arms, which have slower response times, and a limited amount of flexion. Plus,

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## DynamicArm, from previous page

the DynamicArm weighs slightly less than two pounds and can live lift up to 13.2 pounds.

Users of the DynamicArm should expect a brief training period to become accustomed to the arm movements. Practitioners who fit the arm must undergo training at Otto Bock to become certified. Precise fitting of the socket is necessary for the arm to function as designed.

The DynamicArm has been in research and development for nearly a decade, and made its world debut at the Hanover Fair (Industrie-Messe) in Germany, where it was selected as one of the top five innovations for the Hermes Award 2006.

The development of the DynamicArm was based on Orthobionic® Principals. Orthobionics, a protected trademark of Otto Bock, encompasses the company's pioneering efforts into new solutions for persons with limited mobility. According to Otto Bock, the term "Orthobionics" is used when referring to bionics that make use of prosthetic and orthotic competencies in technical orthopedics.

For more information about the DynamicArm, contact Ted Muilenburg at 713-524-3949.



## Muilenburg Practitioners Excel at Upper Extremity Services

For more than 50 years, the practitioners at Muilenburg Prosthetics and Orthotics, Inc., have been fitting and fabricating prostheses for patients with upper extremity amputations and deficiencies, including fingers, partial hand, below and above elbow amputations, shoulder disarticulation, and forequarter and birth defects.

Our upper extremity specialists are trained and certified to offer a wide range of prosthetic choices, including myoelectric devices, the Utah Arm, and the DynamicArm, as well as conventional body-powered units. To ensure our patients receive the best prosthesis for their needs, we keep current with the latest in technology



Earl Fogler, CP, with a patient demonstrating the abilities of her upper extremity prosthesis.

certified in the latest technology, they learned their craft early on from well-known practitioner Bill Brunner. Brunner, a contemporary of Muilenburg's Prosthetics and Orthotics founder, Al Muilenburg, began working with myoelectric controls in the early 1970s when the technology was still in its infancy. Brunner pioneered some of the prototype myoelectric devices at a time when technology was very limited.

At Muilenburg Prosthetics and Orthotics, the volume of upper arm patients is high in comparison to other practices, in part due to a good working relationship with trauma centers. Over the past 16 years, MPO has fabricated approximately 1,200 upper extremity prostheses. The reputation of MPO's

expertise draws patients from across the United States, as well as Argentina, Bolivia, Pakistan, and Saudi Arabia.

To ensure that the prosthesis meets the needs of the patient, we do a thorough evaluation of an individual's lifestyle, including age, activity level, muscle strength and sensation, ability to utilize the device, attitude and motivation, and the importance of function vs. cosmesis. We consult a patient's physician, rehabilitation therapists, social workers, vocational counselors, and family members. In the process, it is not uncommon to find that the most expensive device, or the most technologically advanced, is not always the best choice.

Most importantly, we make sure the patient understands the options. We take the time to explain the pros and cons of the devices available to them so they can make informed decisions, and ultimately be comfortable and functional with what they wear. We also take great care in instructing our patients in the use, care, and hygienic requirements of both the device and the residual limb.

At Muilenburg Prosthetics and Orthotics, our patients receive complete on-site service. All fitting and fabrication is done in our modern 10,000 square foot facility.

All adjustments, maintenance, and repairs of devices are also done on-site by the MPO staff. Designed for patient comfort, privacy and convenience, our office is completely accessible and offers wheelchair-accessible parking.

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**... a combined experience of more than 60 years in fitting upper extremity patients.**

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through continuing education, seminars, and clinical training.

Ted Muilenburg, CP, FAAOP, and Earl Fogler, CP, LP — only two of the six practitioners who do many of the upper extremity prostheses — have a combined experience of more than 60 years in fitting upper extremity patients. Although they are both

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## Taking a Swing at Golf

Rehabilitation specialists and adaptive golfers enjoyed the annual First Swing Golf Seminar and Clinic March 31 and April 1, hosted by TIRR and Hermann Golf Course.

The first day of the event offered instruction to rehabilitation specialists and golf professionals on how to correctly teach the game of golf to those with disabilities. The second day's activities, held at Hermann Golf Course, provided a chance for newcomers to adaptive golf to receive instruction and practice their techniques at the driving range.

Approximately 40 people attended the sessions, including Muilenburg practitioners Jon Holmes, Earl Fogler, Andre Martinez and Ann Sanders.

Due to the success of the event, a program called Community Adaptive Golf has started up and is meeting on the second Saturday of each month, from 9:00 a.m. to 12:00 p.m. at Hermann Golf Course, for more details, contact Genny Marshall at 713-797-5997.

The National Amputee Golf Association (NAGA), in conjunction with the Disabled American Veterans Charitable Trust, sponsored the event. For more information on amputee golf, visit [www.nagagolf.org](http://www.nagagolf.org).

