

smallMiracles

PROSTHETIC & ORTHOTIC MAGAZINE

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Patient Profile

Andrea Mosca: Learning Other Ways To Do Things

New CoApt
Myoelectrics

LAWALL
PROSTHETICS & ORTHOTICS

New CoApt Technology Takes Myoelectrics to the Next Level

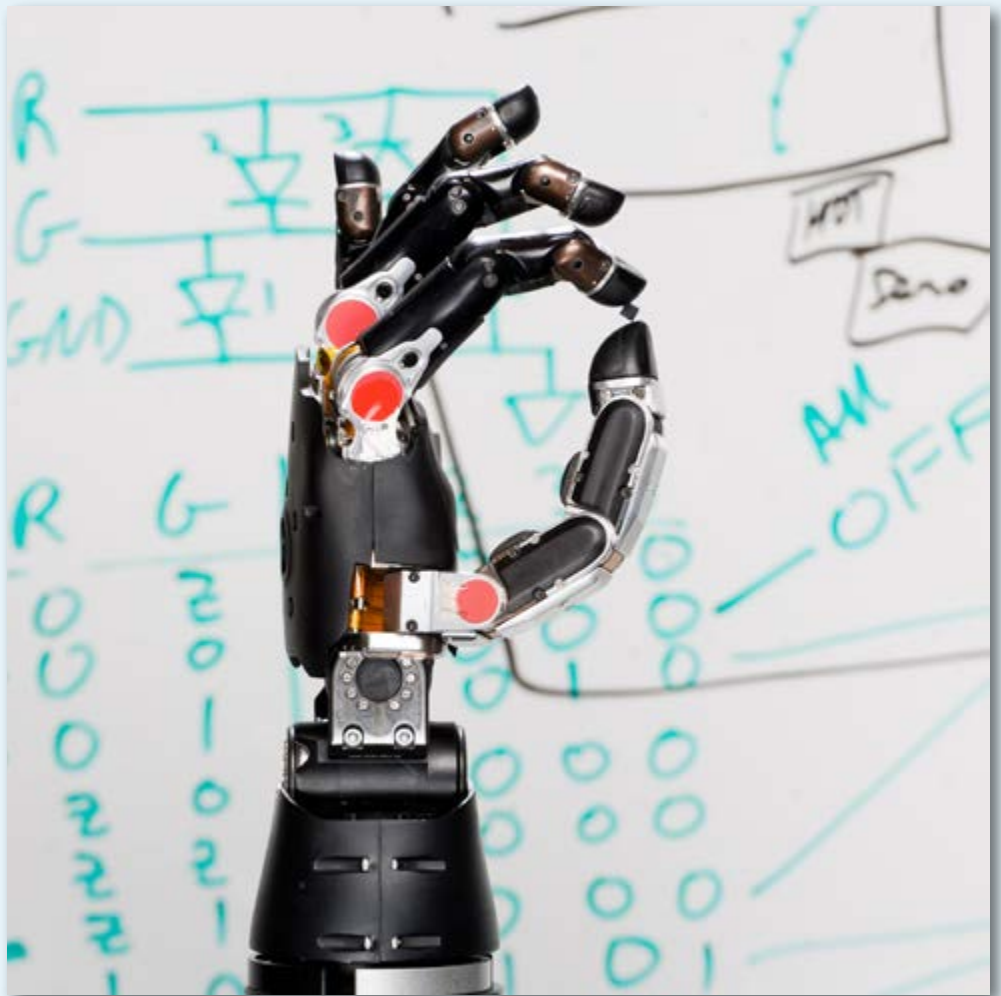
Years ago when dual site control for myoelectrics was first introduced, it was a huge step forward for upper extremity prosthetics. Being able to control a prosthetic hand, wrist or elbow without having to utilize shoulder abduction, flexion or extension provided many advancements that opened new doors for upper extremity amputees.

The original i-Limb was controlled with a simple open and close function which was considered groundbreaking at the time. The i-Limb prosthesis quickly made its mark on the O&P industry and changed the lives of many of Lawall's upper-extremity patients.

Since its introduction in 2007, new advancements in the i-Limb's control systems have been made and continue to evolve. The latest incarnation of the i-Limb, the i-Limb Ultra, is a myoelectric, multi-articulating prosthetic hand with 5 individually powered digits plus an electrically rotating thumb. The mobility of the fingers and thumb permits 18 different grip options to be programmed into the hand.

Recently, within the last 2-3 years, the CoApt system has become available as an alternative to the standard dual site myoelectric control. Traditionally, when an amputee uses a myoelectric prosthesis they must generate a strong EMG signal that can be isolated to activate the sensor. Strength and timing of the activation signal will tell the prosthesis how to function.

To illustrate this, consider the process a wearer would follow in order to rotate their wrist and then close their hand. He or she



must first use the myoelectric sensors to turn the wrist pause and then use the same sensors to close the hand. It is not a fluid or smooth process.

However, the CoApt system is designed to better decode myoelectric signal patterns. It uses a mathematical algorithm to interpret the user's myoelectric signals which result in fluid patterns of multiple prosthetic movements.

With the CoApt system the amputee has

direct access to their desired movements. Now if they need to rotate their wrist and open their hand they can do so in one fluid movement. This provides the most real-life recreation of the anatomical hand we have seen so far in prosthetic technology and Lawall looks forward to sharing what the future holds with our patients. 🦋

Lawall to Open New Main Office After More Than Four Decades

In 1977, after acquiring years of experience in the O&P profession, Harry J. Lawall, Sr. decided to embrace his vision of providing the best O&P care in the country and strike out on his own. The father of nine, partnered with his eldest son, Harry, Jr., a newlywed and recent graduate of New York University. Together they began servicing the O&P needs of northeast Philadelphia from a three-story building located at 8028 Frankford Avenue.

Originally everything was done on-site with a total staff of just four employees. Thanks to the dedication of these individuals, the company slowly started to grow and new staff members were hired. More people demanded more space, so over the years the building was retrofitted multiple times to meet the company's changing needs.

After Lawall purchased an additional building across the street at 8031 Frankford Avenue in 1998, the company endeavored to keep the two separate offices working as one unit for more than twenty years. Their commitment to improving lives by providing compassionate care and the highest quality O&P services never wavered.

Four decades later, the company operates more than twenty patient care locations in four states with a staff of over 200 who remain committed to the founders' original vision of providing the best O&P care available to our patients. In order to continue this commitment, **we are making a large investment in the future by purchasing a 35,000 square foot building located on the outskirts of Philadelphia in Langhorne, PA.** This facility is currently being renovated to meet our unique needs.

When completed the building will house side-by-side orthotic and prosthetic fabrication labs filled with modern machinery that will allow the company to streamline our processes to create a more efficient workflow. In addition, our front end and back end teams will have a shared space designed to provide a better collaborative work environment. There will also be an extensive patient care center which will allow practitioners to provide top-notch clinical care plus opportunities for orthotic and prosthetic wearers to truly test their devices before leaving the office.

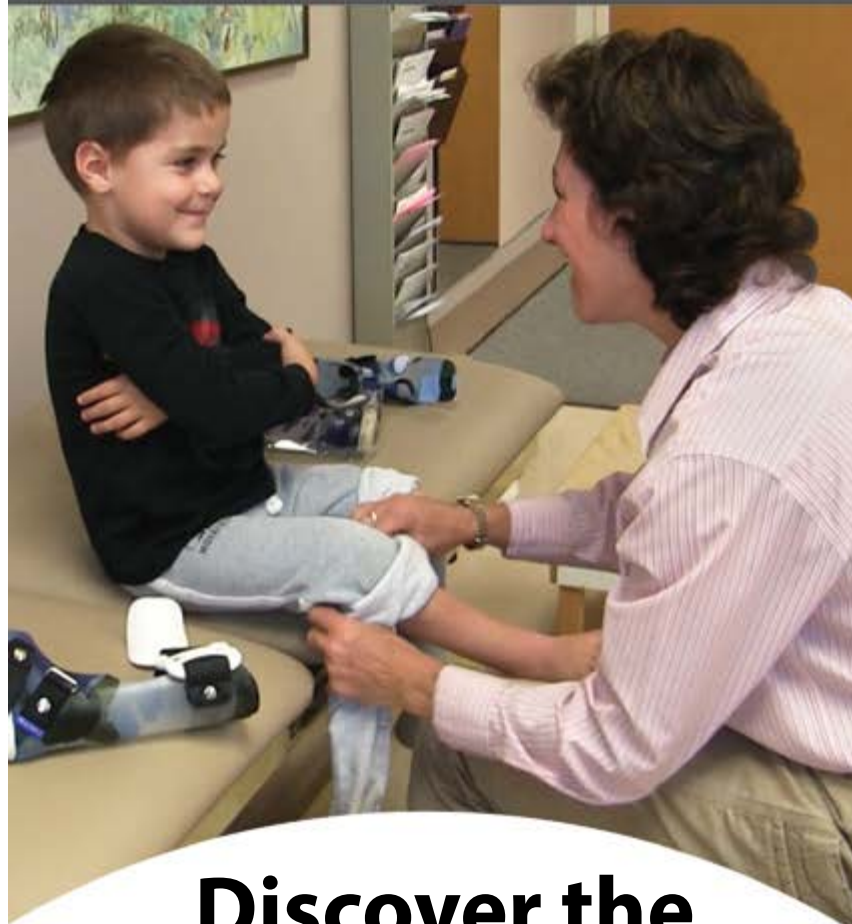
The new quarters will also be designed with employee perks in mind. These include such things as improved natural lighting in work areas, expanded restroom facilities, an exterior break area, and *much more!*

Finally, the building will provide better conference space for the in-service educational seminars we sponsor and will be equipped with the latest communications technology to enable enhanced communication and teleconferencing abilities with the company's other offices.

Keep watching for information about when this new office will open. Once the new office is operational, the company will put the building located at 8031 Frankford Avenue on the market. However, the original building at 8028 Frankford Avenue will remain as a patient service center and will forever represent Lawall's idea of where it all began. 🦋

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– Joshua U., CPO



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Patient Profile

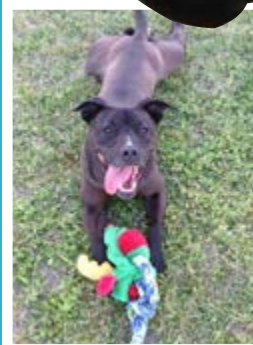
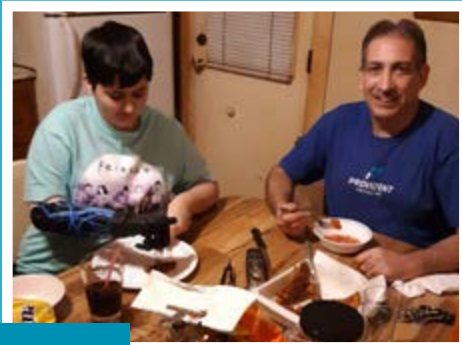
Andrea Mosca: Little Things Mean a Lot

It's the little things that make a big difference, says 26-year-old Andrea Mosca, as she gains coordination and precision digital dexterity with the myoelectric prosthesis she's been using in place of her right hand since November 2020.

Her battle began on September 1, 2019, however, when a dog attack not only damaged her face, but destroyed most of her hand. "When I got to the hospital, there was no thumb, and the back of my hand—all the nerves and tendons were gone. My fingers were there, but they were dead," she remembers.

After two weeks in the hospital, following a below-elbow or trans-radial amputation, she was transferred to Moss Rehabilitation Research Institute, where one

day, she recalls with a smile, Jack Lawall visited her room and announced, "Hi! You don't know me yet, but we're going to be best friends!"



"That was the start of meeting Jack!" she laughed.

So, between multiple reconstructive surgeries to restore her face, Andrea began adapting to her limitations through the use of a body-powered prosthesis that enabled her to control the terminal hook by retracting or protracting her shoulder muscles to activate cables that opened and closed the device in order to grip and manipulate objects.

"She experienced a lot of phantom pain, so she wasn't really tolerant to wearing the prosthesis in the very beginning," recalls Lawall's Traci Romano, CPO/L. "She had a lot of swelling in the limb and she was very sensitive to touch."

But as her pain tolerance improved, so did her acceptance and use of the device, and Andrea began exploring different adaptive terminal devices she could use for improving efficiency in her daily activities and hobbies.

In less than a year, Andrea was ready cognitively, psychologically and emotionally to move on to a new prosthesis.

"When Jack asked, 'Hey, how would you like to take a trip to Ohio to learn how to use a myoelectric arm?' I said, 'YEAH! That sounds great!'" she recalls.

The Össur i-Limb hand represents an amazing leap forward beyond previous myoelectric hands, which traditionally feature dual site controls that drive a simple open-and-close function. The i-Limb Quantum's five individually powered digits include a thumb with the ability to rotate, and together, those digits enable 18 different pre-programmed grips—which represent life-changing empowerment for amputees able to choose the i-Limb option.

Andrea had demonstrated the strong EMG (electromyography) muscle signals necessary to control the device, and her successful adjustment to the initial body-powered prosthesis showed that she was capable and willing to succeed with a more complex and versatile device, as well.

Off to Training Camp

The two days she spent training at the Össur Academy upper limb facility in Ohio with her support team—Romano and MossRehab occupational therapist Andrew Lerman, OTR/L—were invaluable.

"They taught me everything that I needed to know about how to work the hand. I was immediately able to do things that I couldn't do for over a year: Simple things, like opening my medicine bottles, opening a bag of chips, or filling up a pot of water—just everyday things that people might take for granted!" she marvels.

"They were such good teachers that I was able to pick up on things right away. They would explain what I needed to do to get a certain grip, or to move my wrist and preposition it in the way that would best allow me to grab something, so we just practiced doing a lot of different things in the clinic."

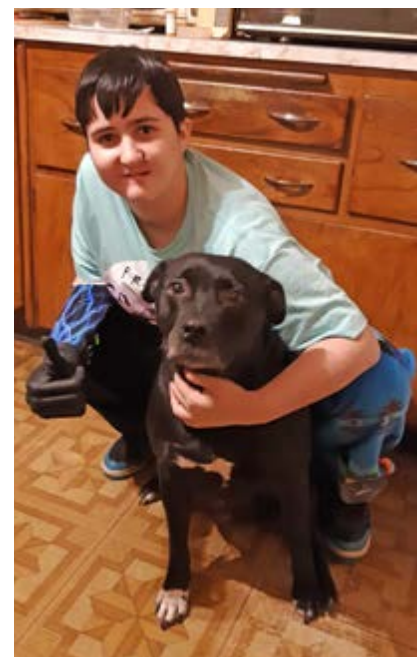
Romano notes that while the upper limb specialists in Ohio shared different tips and tricks for Andrea to use, she was largely able to figure things out on her own.

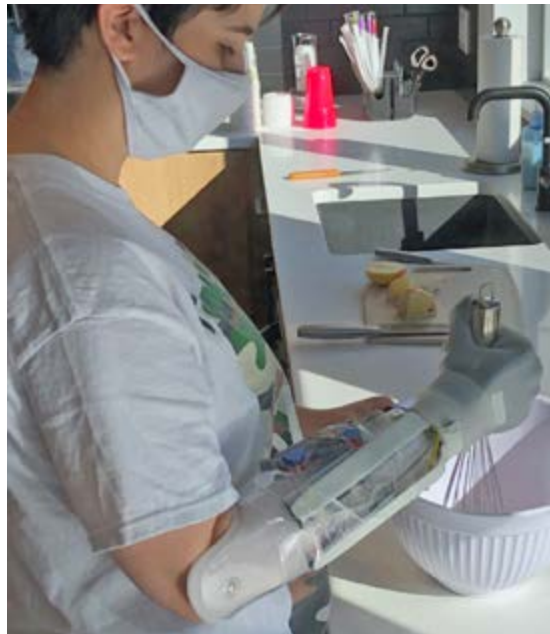
"She would say, 'Okay, maybe the hand is not in the best position to do this task, so let me try to turn the hand a different way.' So I'd definitely call her a quick study in that respect!" said Romano. "She caught on very quickly. Being able to do basic tasks like zipping up her coat and tying her shoes was very important to her; she was very motivated, she was excited, and she loves her new prosthesis."

After her return from Ohio, Andrea continued to do her homework, putting the i-Limb hand to work on her own tasks, so she made even faster progress in her continued OT visits to MossRehab for more practice.

"At MossRehab we maintain a specialty certification in amputation rehabilitation throughout all phases of care," explains Lerman. "I was fortunate to be a part of Andrea's rehab team from the beginning when she was still healing in our inpatient rehab

Whatever the future brings, life will be better now, with the i-Limb Quantum hand... 'I've been thriving with it,' she says. 'I don't rely on my father so much to do every single thing for me. It's given me a little piece of freedom.'





setting, and was in the room when she first met Jack Lawall. We then worked together through two courses of outpatient care as she received first her body powered and then her myoelectric prosthesis.

"At Moss, we maintain a close and collaborative working relationship with Lawall and Jack can often be found on our unit serving his clients and working with therapists. I remember the day when he stopped me in the hallway and asked me out of the blue, 'Do you want to go to Ohio?'"

Lerman offers high praise for the team at Össur Touch Solutions in Ohio: "They were great! Traci and I were able to collaborate with the prosthetist and OT on site to make changes to Andrea's prosthetic—including switching to a smaller size hand and adding a wrist that flexes, giving her more natural range of motion.

"Andrea took to it like a duck to water!" he recalls, noting that after the initial training in Ohio, she was able to achieve

independence with her new prosthetic in just 10 sessions of outpatient therapy at MossRehab.

"We started with the basics of being able to put on and remove the prosthetic independently," he explains, "then moved on to mastery and selection of appropriate grip and grasp patterns available with the i-Limb hand, which allows Andrea to select the grip or grasp she wants through a gesture control system by moving her arm in space."

"It definitely takes a lot of information," Andrea realized. "You have to actively think about how you do things at first, but the more you use it, the more natural it becomes," she notes.

She's immensely thankful for all the "little" skills she's learned that have made such a large difference in her life and her outlook, which is brightened by all the new possibilities that lie ahead.

Although she lives with her retired father, her family ties to a large group of relatives, including her mother, sister, brother,

nephews, niece, uncles, aunts, and grandparents are strong. As a half Italian and half Native American member of the North Carolina-based Lumbee tribe, Andrea treasures her mixed heritage from two colorful cultures, and loves celebrating both of them in tri-state powwows, festivals, and family gatherings.

"My 91-year-old Italian grandmother has been teaching me how to make her recipes, and she's been telling me about her history in Italy and how she came to America in 1947 and her father's participation in WWII. I'm learning so much about our history!" she enthuses.

"And my other grandmother is 81 and she's been teaching me Native American crafts, so I've been making dream catchers, and I've just started making beaded earrings," she adds with pride.

"Before, I was doing the dreamcatchers and beading with one hand, and now I'm able to use the iLimb hand and it makes things ten times easier! So I don't need my Dad to help me so much anymore."

She has also been able to use the prosthesis with special terminal devices that allow her to play pool—one of her favorite hobbies—and to catch, throw, and possibly shoot baskets with her nephew, although she notes that the device is too fragile for full-court basketball games.

"Andrea's activities and interests are as diverse as her cultural background," Lerman reflects, "and she was able to incorporate her new hand into a variety of tasks, including cooking for her family and embracing her Native American roots through beading and making dream catchers—two of which I proudly commissioned for my daughters.

"Her drive, determination and positive attitude have really propelled her forward through all phases of her recovery."

What's In Her future?

Her occupational therapy schedule was completed in January, and she looks to a more independent future, with thanks for the support that brought her to this point.

"My OT (Lerman) was with me from the beginning, when I was an in-patient, and he was just so helpful; he was there any time I needed him and he really taught me a lot. And Traci worked with me one-on-one with fitting the prosthesis, and especially helped me a lot during the Ohio trip. She and Jack are just wonderful people."

Today, Andrea is only five classes away from earning an associate's degree in Criminal Justice at Southern New Hampshire University, and hopes to finish her education soon.

She's also interested in learning more about how to bead and make moccasins, and gain more knowledge of family and tribal history—but she avoids detailed planning. "I notice that when I

plan too far in the future, things change completely," she reflects. "They've changed so many times that I just can't plan for it, anymore."

Fortunately, she has a certain cure for stress that's readily available: Her sister lives on the Shinnecock Reservation in Southampton, New York, free of stores, street lights, or other clutter of civilization.

"It's so beautiful on the reservation, so peaceful, with nothing but houses and trees. At night you can see a million stars. I love going there," she observes. "Whenever I get stressed here, I go there for maybe a week or so, and it just clears my head and I come back a refreshed woman."

Whatever the future brings, life will be better now, with her i-Limb Quantum hand, she believes. "I've been thriving with it," she says. "I don't rely on my father so much to do every single thing for me. It's given me a little piece of freedom.

"Since I've gotten the arm, I don't have to fight. Everything isn't such an effort anymore; things have gotten easier. So I've just been living in the moment and I've been extremely happy.

Her goal is to stay completely happy, spending time with her grandmothers, her uncles, visiting her sister on the reservation, where she also sees her mom, nieces and nephews—and enjoying time at home with her father and her dog Bear, who is, perhaps ironically, her best friend, as well as a gifted entertainer.

"She's the sweetest dog ever; she couldn't hurt anybody. We had to stay inside a lot this year, with the covid rules, and she just made it so funny and so wonderful!"

The Voice of Experience

Her advice to others facing a traumatic amputation and the prospect of an upper-extremity prosthesis?

"Just don't give up! This is a very big adjustment and it needs to come with a lot of teaching. You've been doing everything one way for your entire life, and it takes time to learn to do it **another way**. The best thing I can say is what my OT told me: 'Don't say you can't do it; you just have to find another way to do it.'

"His advice really helped me; because whenever I thought I couldn't do something, I thought—wait a minute! Let me just step back and think about it for a minute, consider if I can do it another way, and then I'll re-approach it."

So far that advice has worked for Andrea; she still delights in how those little things the prosthesis makes possible have changed her life in a big way, and she laughs as she claims proudly, "I'm just trying to be the most awesome, baddest amputee I can be!" 🦋

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