

VERY ACTIVE 12-YEAR-OLD BENEFITS FROM VAN NES ROTATIONPLASTY

12-year-old Devin M. is a whirlwind on two legs, even if one is prosthetic. He bikes, skateboards, rides his scooter, and attends school every day. He reached a personal goal earlier this year of running for two minutes in gym class. "He's doing really well," said his mother, Lindsay. "His cancer is in remission."

Devin underwent an amputation two years ago as a result of stage 4 cancer. What made his amputation unique is that Devin and his family decided on a Van Nes rotationplasty, a procedure which involves a partial amputation of the leg above the knee. The lower leg and foot are rotated 180 degrees and the tibia is then fused to the proximal femur. The foot is positioned where the knee used to be, with the heel portion in front and the toes pointing back. The ankle now functions in place of the knee joint.

"Rotationplasty is not often the choice because it is not as cosmetically pleasing," said Devin's prosthetist Matt Husnik, CPO/LPO. "But it affords more functions and allows a patient to maintain a very active lifestyle including running and jumping."

"We did our research about the procedure," said Lindsay. "We talked to Devin about it and he stuck with rotationplasty because there would be more functional options. From the beginning he thought it



was really cool. We had a couple of months before the amputation, but Devin never changed his mind. He had a mature outlook on it and there was no reason to not let him make his own decision on it."

The surgery went very smoothly and only took about five hours. "He walked within 24 hours and was home two days later. His chemo stays were longer than his surgery," Lindsay said.

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Matt first met Devin and his parents at their appointment with their orthopedic specialist, Dr. Benjamin Miller.

“As soon as I met them I knew Devin was going to be a really special kid to work with and he was going to do great,” Matt said. “I tried a lot of things with Devin and his family and they were great about allowing me to do so knowing that we were trying to get Devin the best functional outcome and also make him as comfortable as we could.”

Matt fit Devin with a Cheetah Explorer Junior Foot, lightweight and made for somebody who is of a really high activity level. A BOA Closure System laces around the foot and heel like a binding to hold his foot in place. Socket fit can be adjusted with a quick click and turn of the dial to accommodate for volume fluctuation. He also wears a joint and thigh cuff to keep the “knee” stable.

Devin was walking with a temporary prosthesis just a few weeks after surgery and it wasn’t long after that he was out riding his razor scooter and doing a lot of things that a kid his age does. “It took him awhile to get his balance in the prosthesis, but overall he progressed quickly,” Matt said.

Earlier this year, Devin rejoined his middle school classmates. Lindsay said she was worried at first because it was barely nine months since he was walking without crutches.

“He had options to use the elevator or leave class

early but he has not used the elevator once, he doesn’t need to leave class early, and he keeps up with everybody,” Lindsay said.

Matt noted that Devin’s dad has shared videos of Devin going down a water slide and doing amazing jumps with his scooter.

“That is one of the challenges,” Matt said. “Devin is a tough kid to keep up with and we had some components fail because of how active he is. We had to switch out some things just to keep up with him and make sure he has a functional prosthesis that is durable for him. At this point, Devin is back to things he likes to do and if he’s not doing it now, it won’t be long before he figures it out.”

Added Lindsay: “Matt put a lot of thought in the design of the prosthesis so Devin could do everything he wanted to.”

APO WELCOMES NICK MARVIN, CPO/LPO

Nick Marvin,
CPO/LPO,
recently
joined

our staff. He has been an above-the-knee amputee since childhood and began his orthotic and prosthetic career in high school as a technician. Following his undergraduate degree in athletic training, Nick graduated from the Orthotics and Prosthetics program at Century College, White Bear Lake, Minnesota, in 2004. He completed his residency at Shriners Hospitals for Children. Nick is personally and professionally knowledgeable in microprocessor and non-microprocessor knees and feet. He is also involved in disabled sports around the Quad City area. Nick resides in Princeton with his wife, Joy, and their three children, Sophia, Alex, and Zoey.



APO PATIENT SHARES A BOND WITH MISS IOWA 2013

Miss Iowa 2013 Nicole Miller and APO patient Debbie Roberts share a unique bond. Both have congenital limb loss and both are now wearing the bebionic prosthetic hand with Coapt pattern recognition technology. Besides being lowans and among a small group of people wearing the advanced robotic hand, there is something even more special between the two. It was Nicole who inspired Debbie to try wearing a prosthesis again, something she had abandoned more than 30 years ago.

Although Debbie was quite proficient at accomplishing tasks one-handed, after browsing YouTube and seeing a video of Nicole twisting a pepper grinder with the bebionic, she was ready to see if advanced prosthetic technology would be right for her too.

Debbie said she thought, "If Miss Iowa can wear a prosthetic arm, then I can too."

Debbie contacted APO, her original prosthetic provider, and met with Maggie Siebel, CP/LP, who thought Debbie would be a good candidate for the bebionic and Coapt.

The bebionic offers multi-articulating digits and up to 14 functional hand positions driven by actuators and programmable software. The bebionic is enhanced with Coapt's Complete Control System using pattern recognition technology, which uses information from the user's muscle signals to improve the function of the prosthesis.

"My bebionic arm is working fantastic," Debbie said. At first, there was a learning curve, and some refinements were necessary, but Maggie and Nick Ackerman, CP/LP, were able to help. "Maggie and Nick are truly the best, I appreciate all they did for me," Debbie said.

Debbie had another special moment recently. Nicole invited her to be her guest at the Miss Iowa pageant held in June, where the two posed for pictures as they proudly showed off their robotics.



27 YEARS OF AMPUTEE GOLFING AT THE ANNUAL IAGA TOURNEY

Marking 27 years as Iowa's premier outing for amputee golfers was the annual Iowa Amputee Golf Association (IAGA) Tournament held July 13-15 at the Willow Creek Golf Course in West Des Moines. The event kicked off with a scramble open to the general public on Friday followed by refreshments, door prizes, and awards. The amputee tournament began the next day and continued through Sunday. A banquet was held Saturday and a luncheon and awards ceremony followed Sunday's finish.

Overall winner of the amputee tournament was APO's Nick Ackerman with a score of 147 for 36 holes.

THE TOP THREE WINNERS IN THEIR AMPUTEE DIVISIONS WERE:

Super Senior Flight – Chuck Kruse (169), John Craine (181), Steve Goshon (184);

Senior Flight – Ron Johnston (154), Mark Ramsay (163), Walt Morris (171);

Leg Flight – Donnie Coyner (149), David Collins (157), Steve Husome (161);

Arm Flight – Matt Nedved (157), Cory Watson (161), Jared Middlebrook (164);

Women's – Carol Grettum (248), Mary Stark (263);

1st Flight – Neil Daleski (168), Matt Snyder (174), Nick Monroe (177);

2nd Flight – Tim Oelschlager (183), Clint Thompson (184), Harold Ritscher (188);

3rd Flight – James Murphy (188), Jim Crosman (192), John Benway (197).



PM&R PERSPECTIVE - THE AMPUTEE SWAY

Editor's Note: In a series of articles for the APO Newsletter, Cole Cheney offers his first-person perspective as a physician.

Cross your arms across your chest. Stand up. How fast were you able to do so? Which leg did you favor? How far did you lean forward?

These seemingly trivial questions are crucial to the medical team evaluating an amputee. Post-amputation living may resemble that of pre-amputation, but amputees are quietly employing many small compensatory tricks throughout the day. This is a testament to the amputee's resiliency and ingenuity.

Transitioning from bed to floor, climbing stairs, using the toilet, bathing and working each require pre-planning, practice, recruitment of new muscle groups, and occasionally, assistive devices. That being said, a return to occupation, utilizing public transportation, bathing oneself, and maintaining intimate relationships is readily achieved by new amputees. According to a 1984 study, half of all new amputees remain in their previous occupation, over 80 percent maintain intimate relationships, and over 90 percent use public transportation (Narang, et al.). Prosthetic technology has progressed significantly since the study and I suspect functional capabilities are much higher now.

One of the more studied areas of these amputee "tricks" has been in sit-to-stand. Any amputee or prosthetist will endorse a visual side-to-side sway as the amputee rises, with an exaggerated forward fold. Some labs have used special sensors on the ground, on the knee, and on the



Dr. Cole Cheney

hip to measure the forces and motions of amputees as they rise from a seated position (researchers including Highsmith, Ozyurek, Roebroek).

The data has been fairly consistent: amputees rise just as quickly as those without amputations. The way they do so, however, involves a couple of "tricks." Amputees put nearly all of their weight onto their non-amputation limb. They also "sway" to a greater degree both side-to-side, and forward-to-back. This recruits both "healthy" limb muscles (due to asymmetry) and momentum (due to sway) to achieve a normal rise time.

This is academically interesting, but what does this mean? New biomechanics means new risks for amputees. Hip and knee osteoarthritis, strain injuries, and skin wounds on the amputees' healthy side are common. Early decline in "healthy" limb functionality is a nuisance. Late "healthy limb" decline can harbor contralateral debility or even amputation. Bilateral amputees face a much higher barrier to everyday functionality and a second amputation should be avoided at all costs. Early and often evaluation of the amputee by their prosthetist and medical team is crucial to minimize asymmetry and resultant injuries.

Again: Cross your arms across your chest. Stand up on one leg. How fast were you able to do so? How far did you sway? How far did you lean forward?

I will address interventions, therapies and treatments in my next piece.

Dr. Cole Cheney is in his second year of residency at the University of Utah. He previously collaborated with American Prosthetics & Orthotics on functional amputee outcome studies.

CONGRATULATIONS MALENA AND MATT ON YOUR PROMOTIONS

We are pleased to announce two promotions: Malena Billups, CPO/LPO, was named Director of Education and Matt Husnik, CPO/LPO/ATC, was named assistant manager of the Iowa City office.

Malena has been with us since 2007 and sees patients at all three of APO's Iowa City offices. She is a graduate of the University of Iowa with a degree in athletic training and completed orthotic and prosthetic studies at Northwestern University. She is certified to fit the C-Leg, the RHEO KNEE, and the i-limb Hand, and is a member of the Iowa Prosthetic Orthotic Pedorthic Association (IPOPA). Malena and her husband, Nate, and their children, Amelia and Charlie, reside in the Amanas.



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CONGRATULATIONS MALENA AND MATT *(Continued...)*

Matt studied physiology at the University of Iowa and has a background in athletic training. He began his career at APO in 2009 as an orthotic resident. He received his certification in orthotics in 2011 and prosthetics in 2013 from Northwestern University's Prosthetic-Orthotic Center. Matt is the resident mentor for the Iowa City offices and a member of the Iowa Prosthetic Orthotic Pedorthic Association (IPOPA). He is i-limb/i-digits and C-Leg certified. He resides in Iowa City with his wife, Lindsey, and son, Theo.



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