smallMiracles

PROSTHETIC & ORTHOTIC MAGAZINE

ISSUE 12 • SPRING 2017

Immediate Post Op Prostheses May Offer Benefits After Amputation

RUSH Rogue™ Foot Provides 3X More Flexibility Than A Carbon Fiber Foot

The Three Different Categories of Pain Experienced After An Amputation

Patient Profile

Ellie Long - Outswimming Scoliosis

LAWALL
PROSTHETICS & ORTHOTICS

Ellie Long with her swimming coach Vladimir "Vlad" Pyshnenko, former Olympic Gold and Silver Medalist.

Immediate Post Op Prostheses May Offer Benefits After Amputation

There are several options available for residual limb management following a below knee amputation. The most common is an application of a shrinker or ace wrap to control edema by providing compression. A more progressive approach is the use of an Immediate Post Operative Prosthesis (IPOP) or rigid dressing. Historically, rigid dressings consisted of a cast applied to the patient's limb after surgery. They not only provided compression to the limb, but they were also designed to protect the limb after surgery. If a patient fell or bumped their residual limb, the integrity of the limb and sutures would be protected.

The idea of an Immediate Post Operative Prosthesis (IPOP) dates back to 1893. The traditional IPOP was designed with a non-removable cylinder cast. When the limb needed to be inspected or the patient experienced volume loss the cast needed to be cut off and the patient remeasured. The process of recasting can be burdensome and the inability to easily inspect the limb can be dangerous, especially for the diabetic population. About 20 years ago, the removable immediate postoperative prosthesis was designed. Currently, it is made of a thermoplastic shell with padding or air bladders on the inside. This new design allows for easy wound care inspection and variable compression as the volume of the limb changes.

While there is a need for more research and outcome based studies in this area, anecdotal reports from physicians have indicated there are several advantages to this progressive form of rehabilitation. It is believed that wounds heal faster and there is less pain and edema present after surgery. Knee flexion contractures can be combated earlier, and the limb is better shaped and remodeled in preparation for the definitive prosthesis. There is also a large psychological advantage of having something immediately present to take the place of the missing limb after an amputation. The IPOP is certainly not for every patient. Patients with circulatory and sensation issues, or fragile tissue surrounding the amputation site are not good candidates. Furthermore, patients who are excessively obese, have dementia or are unable to comprehend instructions would not be candidates for an IPOP.

The best results from an IPOP occur in a team setting. The IPOP can speed up the recovery process and get patients back on their feet sooner, but there must be a strong clinical team available. The application of the IPOP can be labor intensive and time consuming. It also initially requires more follow-up appointments from the patient's care team. However, when applied in the correct setting this can be a great option for a patient undergoing an amputation.

40 Years of Small Miracles

LAWALL 40 YEAR ANNIVERSARY

Founded in 1977 by Harry J. Lawall Sr. & Harry J. Lawall Jr., Lawall Prosthetic & Orthotic Services is celebrating 40 years of serving the needs of our patients in 2017. Throughout the past four decades, we've remained steadfast in our commitment to assist those we serve in reaching their goals and living life to the fullest. Our company's history of investing in new technology and specialized training for our staff has allowed us to continually deliver prosthetic and orthotic devices of the highest quality available.

Patient Profile

Outswimming Scoliosis:

THE Ellie Long STORY

Ellie Long has been swimming since she was seven years old—and competing in state-level meets before an adolescent growth spurt threatened her swimming career and changed her life.

X-rays taken during treatment for an unrelated abdominal issue when she was almost 13 revealed that Ellie's spine had an abnormal degree of curvature (28 degrees).

Idiopathic Scoliosis (IS), a condition in which the spine begins to curve, also exhibits a three-dimensional element of rotation in that curvature. IS cases like Ellie's vary widely regarding age of onset, and size and flexibility of the curve.

In Ellie's case, no external clues were present; the X-ray that is normally required to confirm a diagnosis was the first indicator of her condition.

Ellie's mother, Heather Long, remembers the diagnosis clearly. "Her pediatrician referred us to duPont and Dr. Shah, and he immediately said, 'She needs to get a brace,' so that's what we did.

"No one in either my husband's family or my family had ever had scoliosis, that we knew of. So I learned as I went along."

At the time, the Longs were living in New Jersey, and the brace selected for Ellie was a TLSO (thoracic lumbar sacral orthosis), developed by Lawall in conjunction with orthopedic surgeons at Nemours/Alfred I. duPont Hospital for Children.

Recently Ellie (second from the right) and her little sister Anna (far left) served as bridesmaids at their cousin's wedding.

When Ellie's not *in* the water she enjoys being *on* the water. She and her cousin Emma spend time together boating and participating in all types of water sports on Winona Lake.

Several TLSO designs are available—all are lightweight rigid braces customized to fit the wearer, and they are usually worn under clothing for 18-20 hours per day.

The Wilmington Jacket required a cast of Ellie's torso, and an X-ray taken while in the cast, to ensure best fit and optimum corrective value. The brace's purpose was essentially to prevent Ellie's 28 degrees of curvature from worsening to an extent that required surgery, which is indicated in cases where curves measure between 40 and 50 degrees.

Shortly after Ellie received her brace, her family moved to Chicago in August of 2013.

"At the time we moved," Heather remembers, "she had not been through her major adolescent growth spurt. She was still 5 feet tall and gangly. But in late 2014 and early 2015, she grew about 6 inches within a year, and she could not fit into her Wilmington brace any longer. Her doctor gave her a script to get a new brace from an orthotist in Chicago."

Heather was amazed by the difference in their approach to fitting Ellie for the brace: measuring her hips, bust, and waist with a tape measure, rather than taking a cast that would allow the brace to fit more intimately and precisely.

Initially, in May 2013, she reports, "Lawall used the X-rays taken by the doctor to make a mold of her shape based on the X-rays. Then, while she was in the mold, they X-rayed her

before they even made the brace, to make sure it would work to correct her curvature. They had to create a brace that sufficiently applies pressure to the part of the spine that is curving, and straightens it. In her case, it looked good—it was like one degree off, so they were able to make the brace from that mold while we waited.

"Then, when the brace was ready—the same day!—she wore the brace and they X-rayed her again to make sure the brace was efficaciously straightening her spine, and it was."

After minor trimming adjustments to make sure it was not rubbing or causing discomfort, Ellie had worn her brace home.

Ellie's new total contact TLSO was ordered and created based on tape measurements, however, and when it arrived in December of 2014, she didn't really like it from the start," Heather recalls. "She said it wasn't comfortable."

Ellie began complaining not only of the discomfort, but of her conviction in February that her curve was getting worse—and she could feel it doing so. Her mother was told this wasn't possible; and in any case, it was also impossible for her curve to worsen so dramatically in just two months.

When her parents began to notice that her curve was, indeed, visibly worse, they insisted on moving up Ellie's scheduled appointment to early April.

"We went then and the x-rays were disheartening," Heather explains. "As one of the top spine surgeons in the country, her doctor sees all variations of scoliosis and he was astounded at the abnormal progression of the curve and the rapid progression. He said, 'This doesn't even look like the same spine anymore!'"

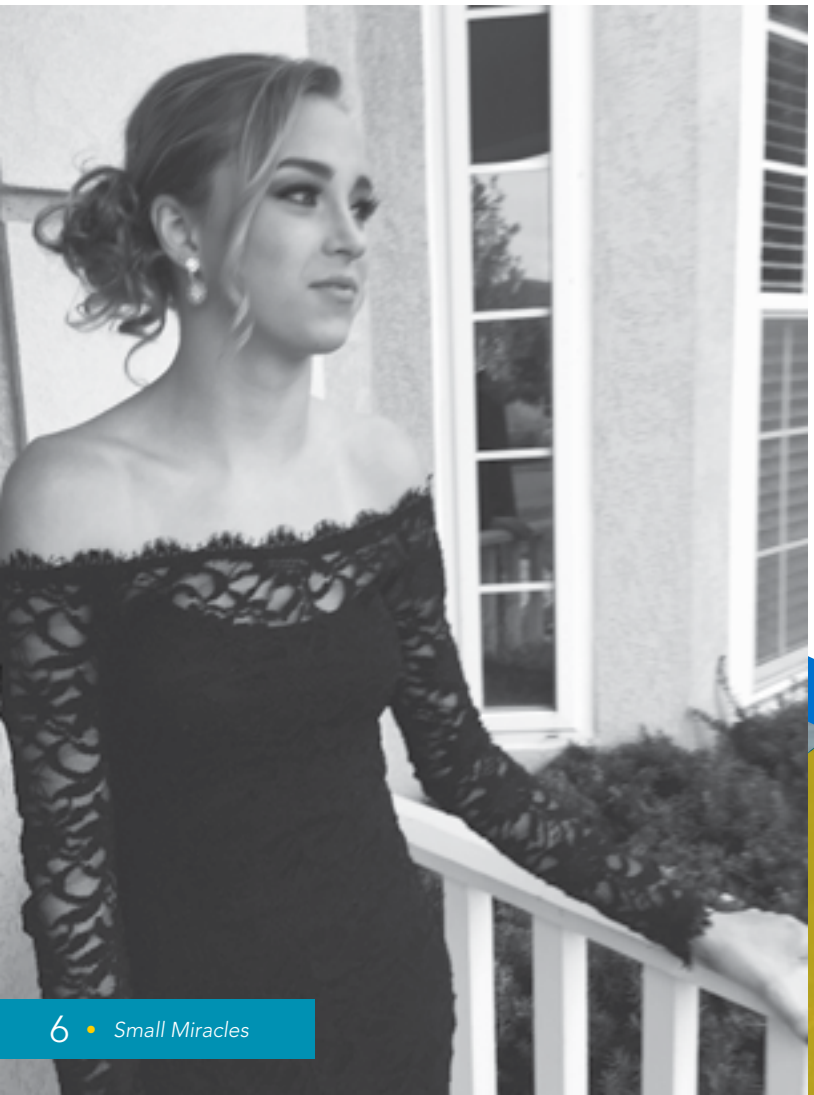
The degree of curve had increased dramatically, (so much so that the doctor sidestepped quantifying it specifically), suddenly and unexpectedly. Feeling desperate, the Longs appealed to their surgeon, who could see their conviction about the Wilmington brace and encouraged them to fly back east and get another Wilmington brace for Ellie.

"I called Lawall," Heather recalls. "And they expedited and got us an appointment in less than a week. They went through the painstaking process of fitting her for the brace—which is outstanding: When they X-rayed her wearing the new brace they had made she was at 1 degree of curve in the brace. The best they could get her correction in the total contact TLSO was 13 degrees."

When Ellie was X-rayed a few months later in Chicago, her spine had improved dramatically—way down from the original 28 degrees, and back to a 16 degree curve.

The highly unusual outcome would have startled experts across the country, from Indiana Spine Group in Indianapolis, Texas, Children's Hospital in Houston, and Shriner's Hospital in Chicago, who delivered cautionary second opinions.

"All of those doctors agreed that what was done was done, and that brace



Ellie recently attended her high school's Homecoming Dance sans orthosis.

was not going to fix the damage that had already been done," Heather notes. "But it did. Ellie feels really grateful to Lawall and so do I—because after her curve worsened so sharply and so suddenly, I really never expected it to ever be this good again."

Ellie's orthotist at Lawall, Heather Michalowski, CO, was also delighted with her outcome.

"We were thrilled that Heather and Ellie trusted us enough to put her care back in our hands," Michalowski said. "Since they were willing to make the trip, we were happy to expedite the process, so as to not lose any critical time in the treatment of her curve. These success stories really speak to the effectiveness of the brace and make me appreciate the advantages we have with scoliosis treatment here in the hospital.

"Even with the most well-made brace, it only works if it is worn," she added. "Ellie's compliance is what ultimately led to the success of brace treatment and there is no better feeling than when the patient reports to us that they are done with brace treatment and have managed to escape any kind of surgical intervention."

The brace—which she wore most of the time when she was not at practice or at a swim meet—enabled Ellie to continue

As part of her practice regimen and when healthy, Ellie swims an average of two to four hours per day, six days per week. Here she practices her backstroke at the The Centre Club pool in Libertyville, IL.

swimming, as well as to compete in other sports and social activities, while preventing her curve from getting worse.

"She's an athlete; she's a swimmer," her mom sums up, "—and she's still swimming!"

For Ellie, the brace has done its work well, as time has confirmed. Now a high school sophomore at age 16, Ellie is 5'7 ½" tall, and has largely reached her growth ceiling and passed the threat of further curvature affecting an unsupported spine. So, in February, the brace was shed like a chrysalis, and Ellie is enjoying her new freedom. After several months without it, Heather reports, Ellie's curve measured 21 degrees, which is good news.

She continues to swim competitively—and very successfully!

"She's done phenomenally well," says Heather, who points out that since coming out of her brace, Ellie has also dealt with a severe concussion, a lingering bronchial infection, and a lengthy recovery from shoulder surgery—which have effectively benched her from swimming for many months.

Nonetheless, she has competed at the state level and qualified for USA Swimming Speedo Sectionals, —and looks forward to significant advancement in the future.

Her mom's advice to other parents facing a scoliosis diagnosis for their children?

"One thing is not to read too much online, because there's different research about how quickly the curve progresses—I got myself into trouble by doing that. It's really scary. Listen to your doctor—and find out if the Wilmington Brace is available and appropriate for your child. I'm completely biased—because I saw what it did for Ellie."

LEARN MORE ABOUT SCOLIOSIS:

Check the Fall 2016 issue of Lawall's *Small Miracles* magazine (page 10) for more details about the history and therapeutic management of scoliosis. It is available online at: lawall.com/magazine/2016-fall-magazine

For details about the scoliosis patient mentorship program at Nemours/Alfred I. duPont Hospital for Children in Wilmington, DE, and their annual scoliosis awareness event, call Lawall's on-site office at 302-429-7625.

A Vertical Loading Pylon + A Foot Made of Fiberglass Composite = The *RUSH Rogue*™

Ability Dynamics has recently released their newest *RUSH*™ foot—an improved design that has already impressed the prosthetic community for several reasons: The *RUSH Rogue* builds on the successful glass composite makeup of the *RUSH 87* foot—a welcome alternative to the many available carbon fiber feet. The *RUSH 87's* glass composite structure invested the foot with three times more flexibility than carbon fiber feet, resulting in a more dynamic, responsive and realistic feel for an amputee, as well as enhanced durability.

The R*USH Rogue* improves on the groundbreaking *RUSH 87* by incorporating a vertical loading pylon that provides shock absorption to reduce impact in the socket. It also allows for +/- 8 degrees of rotation in the transverse plane, making the *RUSH ROGUE* an excellent choice for an all-terrain K3 or K4 foot.

RUSH Rogue™ Quick Facts & Features

- Vertical loading pylon
- Provides smooth roll over
- Biomechanical ankle action
- Extreme reliability- intended for high impact use
- Rotational torsion helps reduce pressure on knees, hips, back
- Maximum patient weight: 365 lbs.

The Three Different Categories of Pain Experienced After An Amputation

Pain management, unfortunately, is a necessary topic that must be discussed when dealing with an amputation. The severity, duration, and type of pain are different for all amputees, who must learn to manage their individual pain profile.

Pain associated with an amputation can be broken down into different categories:

Post-Surgical Pain: First, an amputee will have to manage the pain that can accompany any surgical procedure. While in the hospital their "pain level" will be routinely assessed as they are asked to rate their pain level on a continuing and progressive basis. In the hospital, post surgery pain is often managed by nerve blocks, epidural blocks, and spinal blocks. Narcotic pain management can be controlled initially through an IV and then transitioned to pills as a patient gets closer to being discharged. Managing pain immediately after surgery is important because research suggests patients who manage their pain immediately after surgery have fewer issues with phantom pain down the road.[1]

Phantom Limb Pain (PLP) is not imaginary, as the term "phantom" might suggest; it is very real, and must be managed differently from other types of pain. It occurs when a patient experiences pain in the part of the limb that has been amputated, and is no longer present. It is the result of mixed signals that the brain continues to receive from the severed nerves. Patients should not fear they will be branded as "crazy" because the limb is not present; the fact that about 80% of amputees experience PLP should be reassuring to them.

Because the pain doesn't stem from trauma directly to the limb, phantom limb pain must be approached differently, and new therapies are constantly evolving to help patients manage this condition. It is important to report this pain immediately so it can be addressed appropriately.

Treatment for PLP is usually a combination of medications and alternative non-medication treatments. Medications that work to interrupt the pain signals between the brain or spinal cord are often prescribed. Alternative treatment options may include acupuncture, massage of the residual limb, a shrinker, repositioning techniques, mirror box therapy, biofeedback, TENS (transcutaneous electrical nerve stimulation), virtual reality therapy, imagery or music.

Residual Limb Pain (RLP) is another form of pain many amputees face. This is the pain experienced in the remaining part of your limb after an amputation. There are several possible reasons this pain may occur, and the correct reason must be identified in each case so it can be properly treated. The pain may sometimes be attributed to an underlying disease that was present before the surgery, like diabetes or poor circulation.

Sometimes the bone at the end of the residual limb is the issue: A bone spur may have formed, increasing pressure in that area; or the bone may not have been trimmed appropriately or there isn't enough padding at the end of the limb. Either of these cases can result in intolerable pain when weight bearing on a prosthesis. If this is the case, the surgeon may have to perform a surgical revision.

Neuromas are another source of RLP. "Neuroma is a collection, or bundle of nerve endings that forms under the

skin of your residual limb. Think of it like a tangle of hair. It can become very sensitive, especially if the tangles are pressing against your prosthesis."[1] There are medication and non-medication treatment options for neuromas. Some medications that have been shown to be effective are injections of steroids, or non-steroidal anti-inflammatory options. Specific antidepressants and anticonvulsants have been found to be effective, as well. Alternative (non-medication) treatments such as ultrasound, massage, vibration, finger tapping at the site of the pain, acupuncture and TENS (transcutaneous electrical nerve stimulation) are all possible treatment options worth exploring. Another viable option is to have a prosthetist modify the socket to decrease the pressure placed on the site of the neuroma. Surgery is usually not a preferred option when dealing with neuromas.

Regardless of the type of pain an amputee is experiencing, it is important that a physician and a prosthetist are able to work with them through this difficult time. Often it is matter of finding the solution that works for each individual. It can be a frustrating process of trial and error, but in the end their independence will be worth it.

In all cases, the importance of gaining accurate reports of pain levels, and monitoring them closely, cannot be over-emphasized

Here are some important guidelines from the Amputee Coalition of America that can help amputees manage their pain.

1. **Begin exercises as soon as your surgeon allows it.** Standing, walking and muscle stretching not only improve your general health, but also interrupt pain signals.
2. **Desensitize your residual limb,** following the instructions of your physical or occupational therapists; this includes both massaging and wrapping your residual limb.
3. **Work with your prosthetists** to maintain proper prosthetic alignments and to choose prosthetic components that are appropriate to your needs.
4. **Keep a pain journal.** Keeping track of your symptoms and sharing them with your healthcare team will help you find the right treatments for you.
5. **Practice relaxation.** We know that tension and stress increase pain. It is estimated that 50 percent of pain can be reduced by relaxation.

[1] *Pain Management , "Amputee Coalition of America" http://www.amputee-coalition.org/limb-loss-resource-center/resources-for-pain-management/*

LAWALL
PROSTHETIC & ORTHOTIC SERVICES

8028 Frankford Avenue
Philadelphia, PA 19136

OFFICE LOCATIONS

PENNSYLVANIA

Philadelphia
8028 Frankford Avenue
Philadelphia, PA 19136
Phone (215) 338-6611
Fax (215) 338-7598

Pottstown
Sunny Brook Village
800 Heritage Drive
Suite 803
Pottstown, PA 19464
Phone (610) 705-5797
Fax (610) 705-5795

Willow Grove
701 North Easton Road
Willow Grove, PA 19090
Phone (215) 657-3344
Fax (215) 657-3742

Springfield
Crozer-Keystone
Medical Pavilion II
100 West Sproul Road
Suite 123
Springfield, PA 19064
Phone (610) 544-1281
Fax (610) 544-1387

Hershey
Hershey Medical Center
30 Hope Drive, Suite 2100
Hershey, PA 17033
Phone (717) 531-5882
Fax (717) 531-4309

Harrisburg
883 S. Arlington Avenue
Harrisburg, PA 17033
Phone (717) 541-1605
Fax (717) 541-1607

Yardley
906 Floral Vale Boulevard
Yardley, PA 19067
Phone (215) 504-1932
Fax (215) 860-2068

Coopersburg
551 E. Station Avenue
Coopersburg, PA 18036
Phone (610) 705-5797
Fax (610) 705-5795

NEW JERSEY

Lawrenceville
86 Franklin Corner Road
Lawrenceville, NJ 08648
Phone (609) 895-1141
Fax (609) 844-0284

Cherry Hill
1030 N. Kings Highway
Suite 301
Cherry Hill, NJ 08034
Phone (856) 616-1885
Fax (856) 691-7147

Vineland
3071 E Chestnut Avenue
Suite C
Vineland, NJ 08361
Phone (856) 691-7764
Fax (856) 691-7147

Cape May Court House
1261 South Rt. 9
Cape May Court House
NJ 08210
Phone (609) 463-1042
Fax (856) 463-1070

DELAWARE/ MARYLAND

Dover
514 North DuPont Highway
Dover, DE 19901
Phone (302) 677-0693
Fax (302) 677-0930

Wilmington
A.I. DuPont Institute
1600 Rockland Road
Wilmington, DE 19899
Phone (302) 429-7625
Fax (302) 429-7683

Wilmington
1822 Augustine Cut-Off
Wilmington, DE 19803
Phone (302) 427-3668
Fax (302) 427-3682

FLORIDA

Orlando
Nemours Children's Hospital
13535 Nemours Parkway
5th Floor
Orlando, FL 32827
Phone (407) 567-5190
Fax (407) 567-5191

www. LAWALL.com