NATIONAL LYMPHEDEMA NETWORK

NLN

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NATIONAL LYMPHEDEMA NETWORK
Latham Square
1611 Telegraph Avenue, Suite 1111
Oakland, CA 94612-2138
Telephone 510-208-3200
Website www.lymphnet.org
E-mail nln@lymphnet.org

The mission of the NLN is to create awareness of lymphedema through education and to promote and support the availability of quality medical treatment for all individuals at risk for or affected by lymphedema.

The NLN is dedicated to:

- *promoting research into the cause, prevention and treatment of lymphedema*
- *securing adequate insurance coverage for medically necessary, safe and effective treatment,*
- *expanding the number and geographical distribution of lymphedema treatment facilities and certified therapists.*

To achieve these goals, the NLN disseminates information about lymphedema to health care professionals so they can appropriately counsel their patients on its avoidance, and prescribe safe, effective treatment for those affected by this condition. The NLN also provides this information to the general public.

The Garments We Wear

By Paula J. Stewart, MD, MS, CLT-LANA

INTRODUCTION: There are many challenges in the treatment and management of those with lymphedema (LE). Diagnosis and treatment can prove very difficult, but most practitioners will admit that compliance with garment wear in the maintenance phase of treatment is often the most challenging aspect of LE management.

The treatment of LE is comprised of two phases: the first phase is the treatment phase, which includes complete decongestive therapy with a combination of manual lymphedema drainage, complex bandaging, instruction in skin care, exercises and risk reduction for lymphedema. Once the LE has been reduced, phase two—maintenance—is usually achieved by fitting the involved limb with an appropriate compression garment. It is important to understand that compression garments do not further reduce LE. Thus, it is critical that full reduction occur during the treatment phase. Garments serve to maintain the reduction achieved during the treatment phase. Most patients choose to wear garments instead of bandages during daytime hours because they are less bulky and more cosmetic than bandages. Bandaging nightly can be tedious and time consuming, thus some will use a compression device instead. There are a variety of devices available: some use dense foam chips inside a conforming sleeve to compress the limb at night; other devices use consecutive Velcro straps to conform to the limb and provide a low stretch and adjustable device for night time use and others combine a foam sleeve with Velcro straps for night time use. Occasionally, a sequential compression pump will be added for limbs which fail maintenance with a combination of bandaging, garments and other devices.

There are two types of garments: ready made and custom. Ready made garments are made from circular knit materials that are continually knitted on a cylinder and thus have no seam. Garments are made by varying stitch height and yarn tension to create an appropriate shape and size. Circular knit garments are lighter weight and tend to be more cosmetic than flat-knit garments. Flat knit garments are used primarily for custom made garments. Material is usually thicker but very breathable. Based on the careful measurements of a trained or certified measurer, a computer is programmed to control the production of garments which are knitted as one piece, shaped by adding and removing needles. The flat piece is then joined by a seam to form the custom garment.

There is a wide variety of garment types available, everything from toe caps or foot gloves to open or closed toe stockings either to the knee or thigh. Chaps style should be avoided in the very obese or the very short. The medial side of the stocking will cut into the tissues in the thigh of the obese. Panty hose are available with two full length legs or one and a half legs. There are gloves to the first or second finger joints and gauntlets available. Sleeves can be worn from the wrist to the axilla or wrist to a shoulder cap with strap to help keep the garment in place. For LE affecting the trunk there are compressive vests that can be fabricated, and one piece garments that include a bra, truncal support and panty. There are specialized bras for LE of the breasts. For head and neck LE, a custom garment or a foam chip device can be worn at night with no compressive garment or device worn during the day, since the patient is upright and the LE will tend to drain away from the head and neck.

In the U.S., compression is graded from a Class I: 20-30 millimeters of mercury; Class II:

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30-40 millimeters of mercury; Class III: 40-50 millimeters; Class IV: greater than 50 millimeters of mercury. Categories differ from European measurements: German standards are Class I: 18-21 millimeters of mercury; Class II: 23-32 millimeters of mercury; Class III: 34-46 millimeters of mercury; Class IV: greater than 49 millimeters of mercury.

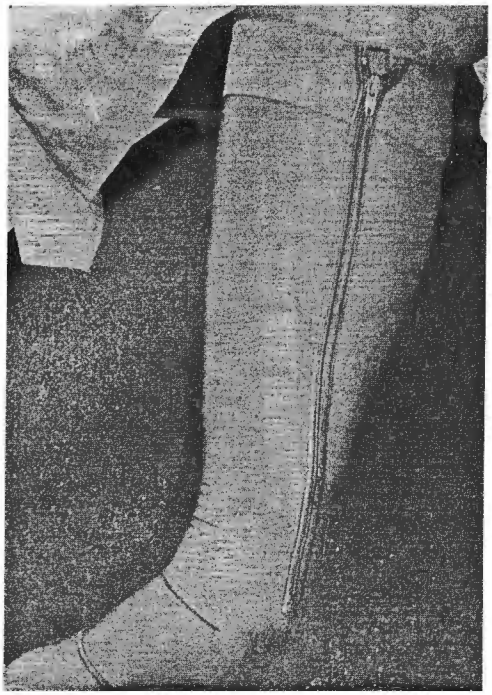
In general, a Class I garment is prophylactic for early to mild LE, which is defined as ISL stages I-II with minimal to no shape distortion in the limb. It also can be used for maintenance in mild cases or for palliation in more severe cases. Elderly patients who have difficulty donning heavier compression garments can layer Class I garments to achieve an effective maintenance compression. Some patients are pressure sensitive and cannot tolerate higher compression than Class I. There are other edema-related conditions that respond well to Class I garments such as edema in congestive heart failure, or dependency.

Class II garments are often utilized in moderate to severe LE, or ISL late stage II to III of the upper extremities. There is often some shape distortion in the affected limb. Class II garments are also useful for phlebo--LE, if ulcers are healed. Class III garments are best used in lower extremity limbs and ISL stage III or severe LE. The limb is almost always distorted by LE when Class III is ordered. Class III can be useful in very active patients with LE, especially when they have failed Class II garments. Class III is also utilized in phlebo lymphedema patients with active ulcers and can be useful in patients with gross forefoot edema and retro malleolor edema.

The very highest class—Class IV—is reserved for more severe and complex LE patients that are almost always Stage III with distorted limbs. Typically, these patients will require custom made garments and it is important their ABI ankle-brachial index is greater than 0.8, given the high compression of these garments.

Often, patients will be unable to don heavier compressive garments unassisted. Class IV garments often require zippers or other devices to aid application. For those who have difficulty donning a heavy compressive garment, two garments of lesser compression can be layered; for example, two Class 1 garments can be used to achieve up to 40 millimeters of mercury pressure. Typically, the second garment will add about 70% of the pressure applied by the first garment.

Care of the garments is very critical to their maintenance and effectiveness. Garments that are not washed frequently enough often lose their elasticity. It is important to follow the manufacturer's guidelines in the care of garments which usually recommend washing with a mild detergent in warm water (up to 104 degrees) to remove skin oils and avoid damage to the fibers and air drying.



Photography courtesy of Lymphedema Therapy, Woodbury, New York

Compression garments can be difficult to apply and there are multiple devices that can make this process easier. For open toe garments of the lower extremity, there are silk slippers that allow garments to slide more easily over the foot and heel. They are pulled out from the open toe in the stocking once it is on. There are also stocking donners, metal or polyethylene—devices that the garment can be loaded on and placed onto the limb and pulled out. Zippers can be added, but are usually reserved for flaccid limbs or wounds. Zippers on gloves should be placed on the dorsum. For a better fit and ease of donning, garments can be made in two pieces to allow for overlapping at the knee, especially if there is a large size differential between the distal and proximal portion of the limb.

There are multiple problems that can arise from garment wear. Some people have the misfortune of being allergic to the garments. There are materials available commercially in which the latex is individually wrapped in cotton, preventing the contact of the latex to the skin. Additionally, garments lined with silk are available. Also, the individual can attempt to wear a stockinet under their sleeve. Care must be taken, however, since it can bunch and cause pressure areas underneath the garment that can be uncomfortable or cause skin injury. Arm sleeves, thigh high or knee high garments will often slip down the limb. To help with this problem, garment skin adhesive is available to hold the garment in place. Silicon bands can be applied to the proximal end of the garment to help keep the garment from slipping. These are available inside the garment or on the end of the garment and are available in different widths. Caps can be applied to arm sleeves to secure garment with attached straps or the arm sleeve can be secured with a Velcro bra strap attachment. In the lower extremity, the garment can be extended into a full panty, anchored by a panty leg, or can be fabricated as a chap with an anchoring waist piece, also called a thigh with waist attachment. It can be further fixed in place by wearing light weight shapers or bike style pants over the top of the chap style or panty hose to prevent slippage. Usually, garter belts are available to hold thigh high garments in place, although this can be uncomfortable when sitting on the metal fasteners.

Securing an excellent fit of the garment is critical to the success of the mainte-

nance phase of LE treatment. Garments must be fitted by someone who is experienced, or even better, certified in the measurement of the garments. Measuring is best done in the morning before edema re-accumulates and it is best if the bandages are removed just prior to measuring. Bandages should be worn until the garments are ready to wear.

When donning the garment, it is important that all the folds and wrinkles be removed. Often times, a rubber glove can be used to achieve this result. It is important to remember that compression garments should never be worn with the top folded down. If the skin becomes red, blistered, discolored, or damaged or if swelling increases in the limb, the patient should be instructed to inform the practitioner immediately for assessment and refitting of the garment.

Some common problems encountered when attempting to fit the garments include edematous or swollen toes but toe caps are difficult to fit or to manage. A closed toe garment can be useful during the day and a toe wrap with bandaging at night or a toe wrap with an appropriate device, can be used. If forefoot swelling is problematic, an open toe stocking combined with a foot glove or toe caps can be very useful to prevent the onset of toe edema if not already present. In the instance of foot and/or toe swelling alone, some elect to use bandaging and toe wraps day and night instead of being fitted for a compression garment. For retro malleolar swelling or swelling behind the ankle, use of foam crescent shaped pads can be used to apply pressure in this area. For legs that are shaped like an inverted champagne bottle with large thighs and relatively smaller calves, flat knit garments are often more useful than circular knit. Class III garments are usually most effective. For a very significant difference in size between the calf and thigh, a two piece garment is often easier to fit properly where the foot and calf are fitted in one piece and the thigh piece overlaps at the knee. For the lower extremity, a combination of a flat knit and a circular knit can be useful. The flat knit should be applied first with the circular knit over the top. In LE that extends into the groin, a flat knit custom garment with a closed gusset panty, be it a one legged or two legged garment, should be used with a foam chip pad angled into the groin to apply appropriate pressure to the edema accumulation. Pressure can be enhanced by adding a bike type pant over the panty hose. For obese patients, custom garments are often the only option available; however, the practitioner may wish to investigate pregnancy garments for the most obese patients. These can often be obtained at a lower cost and be very useful for obese patients with LE.

Lower extremity garments should be replaced every three to four months if the patient is ambulatory and upper extremity garments every 4 to 6 months. The patient should be remeasured for each new garment since weight fluctuations, changes in LE, etc. can impact the size of the limb and thus, fit of the new garment.

Contraindications for compressive garments include arterial disease with an ABI of less than 0.5 (we defined this earlier). Persons with severe arterial disease should be referred to a specialist in vascular disease and be advised to elevate their affected limb as tolerated. If the patient has an allergy to the garment, an effort should be made to determine if it is

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a latex allergy or an allergy to the dyes or other components of the garment. Sometimes, alternatives that are hypoallergenic can be found. Other contraindications include acute infections, acute deep venous thrombosis, severe congestive heart disease and wet dermatitis.

Recent study shows that recurrent cellulitis can be reduced in frequency with silver impregnated fibers in compressive garments. Some commercially available garments contain up to 20% silver which is permanently bonded to the fiber and will not wash out. The presence of the silver reduces bacterial and fungal counts on the skin and may contribute to fewer infections and enhance healing in open wounds. Silver fiber garments are useful for reducing odor, keeping limbs cooler and reducing static. Research is ongoing.

Cost is often a barrier to patient compliance with garment wear and replacement. Medicare does not pay for garments; however, Medicaid is electing to do so in several states. Commercial payors are covering the cost in growing numbers due to the efforts of advocacy groups. Physicians can often appeal denials with letters of medical necessity. However, it often falls to the patient to absorb the costs of garments and their replacement; this can profoundly impact compliance. After initial fitting with an experienced vendor, costs of replacing ready-made garments can be substantially reduced by carefully searching the internet for lower cost garments on line.

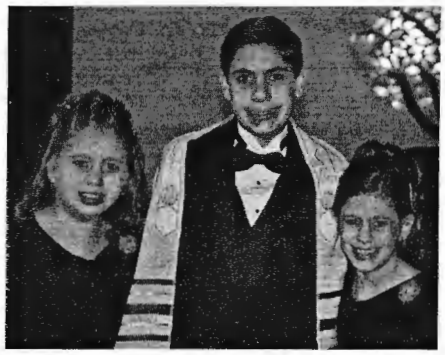
CONCLUSION: There are many factors involved in obtaining and wearing appropriate garments for the patient with LE. Significant barriers to compliance with wear include cost of the garments, frequency of replacement, patient's discomfort, difficulty donning, and appearance. As a consequence, many practitioners are turning to less expensive, more cosmetically acceptable, off-the-shelf clothing that can serve as a compression garment for the LE patient. ❑

Paula J. Stewart, M.D., M.S., CLT-LANA, is Program Director of Cancer Rehab and Lymphedema Services at HealthSouth Lakeshore Rehabilitation Hospital in Birmingham, AL, and an active member of the NLN Medical Advisory Committee. Email: Paula.Stewart@healthsouth.com.

Children Helping Children

Shane Lando, age 13, donated a portion of the gifts that he received for his Bar Mitzvah to the NLN in honor of his sister, Jackie, age 9, who was born with primary lymphedema in her right leg. Shane, who is autistic, addressed his guests, "I'd like to thank everyone for coming to my Bar Mitzvah today. I hope that you have fun today. A portion of my gifts will be donated to *Autism Speaks* and the *National Lymphedema Network*. I hope that Autism Speaks will use the money to help children who may one day be able to speak just like me. The NLN helps educate students to help people like Jackie."

Well done Shane. Mazel Tov!



Pictured are Jackie and Shane with their 7-year-old sister, Anna.