



POSITION STATEMENT OF THE NATIONAL LYMPHEDEMA NETWORK

By NLN Medical Advisory Committee; Approved by the NLN Board of Directors: 07/01/2005; Expires: 07/01/2007

TOPIC: EXERCISE

Exercise presents several considerations for individuals with lymphedema and for those at risk for developing lymphedema.

It is the position of the NLN that:

- Exercise is an integral part of a healthy lifestyle
- Lymphedema exercises (decongestive exercises) as defined below are a standard and integral part of Phase I and Phase II CDT programs for individuals with lymphedema
- In individuals at risk for developing lymphedema, and in those with a confirmed diagnosis of lymphedema, exercise programs may need to be modified to reduce the risk of triggering or worsening lymphedema

For Individuals with Lymphedema

Rationale for the use of exercise:

Exercise is an accepted and integral part of a Complete Decongestive Therapy (CDT) program to treat and manage lymphedema.¹ Exercise positively affects the lymphatic system through the influence of muscle contractions and deep breathing leading to an increase in lymphatic flow. Exercise interventions are employed throughout the span of the CDT treatment program including initial Phase I and Phase II. Exercise interventions in Phase I CDT are performed with short-stretch compression bandages on the involved extremity in order to alter the filtration of fluid from the blood capillaries. As the patient proceeds into Phase II CDT, therapeutic exercise is continued by the patient. Compression therapy during exercise interventions is still indicated during Phase II and is achieved with garments or bandages.

Individuals with lymphedema should understand that activities of daily living may induce a physiologic response similar to that of an exercise program; therefore, adequate compression should be maintained during daily activities.

Considerations for designing an exercise program:

It is important to understand both the positive and negative physiological effects of exercise on the lymphatic system. As noted above, exercise is a standard and appropriate component of CDT. Despite the positive effects of exercise, negative effects can occur. The potential negative effects of exercise on the lymphatic system must be considered when designing an appropriate exercise program. Blood flow is increased during exercise possibly causing an increase in lymphatic load. Increased muscle metabolism results in an increase in metabolic waste. In addition, improper exercise may cause inflammation and trauma. Therefore exercise programs should be modified to maximize the positive effects and minimize the negative effects on the lymphatic system.

The location of the lymphedema, area of lymphatic limitation, and overall health of the individual must be considered when designing an exercise program. Concomitant medical conditions such as cardiac disease, arthritis, high blood pressure, etc. may dictate the design of the exercise program and the type of exercise to be performed. In addition, the prior level of physical activity and environmental conditions (hot weather, high altitude) should be considered in designing a beneficial exercise program. Personal interest of the individual is also important in selecting an exercise routine to enhance compliance.

Types of Exercise, Benefits and Risks

Lymphedema Exercise (Decongestive Exercise)

Lymphedema exercise is defined as non-resistive active motion of the involved extremity. Exercise interventions in Phase I CDT are performed with short-stretch compression bandages on the involved extremity to minimize filtration of fluid from the blood capillaries. Bandaging minimizes the ultrafiltrate, reduces the protein load introduced into the interstitial tissue (space between tissue) and decreases the lymphatic load. The goal of lymphedema exercise is to enhance muscle pump activity and thus promote improved venous and lymphatic return in the involved extremity. The risk of exacerbating lymphedema is low when decongestive exercise is performed appropriately with short-stretch compression bandages worn on the involved limb.

Flexibility/Stretching Exercise

The goal of flexibility exercises is to stretch soft tissues thereby minimizing tightness and the effects of scarring which can block lymph flow. In addition, flexibility for normal movement is maintained and improved. The risk of exacerbating lymphedema when performing stretching exercises occurs when stretching is performed too vigorously. Tissue tears and inflammation can occur. Flexibility exercises should be done slowly and progressed gradually to avoid pain and injury.

Resistive Exercise

Progressive resistive exercise (exercise performed with gradual increasing weight resistance) has been found to be beneficial in the treatment of lymphedema when used as an adjunct to compression therapy interventions as noted above. The introduction of weights should be gradual with the individual's response monitored in order to avoid injury, overuse and exacerbation of lymphedema.² The primary goal of strength training and resistive exercise is to improve muscle power, stamina and tone. This type of exercise poses the greatest risk to individuals with lymphedema. In addition to the risk of tears and injury, strength training increases local blood flow and the production of waste products which increases the load on the lymphatic system. This could result in an increase of lymphedema, or trigger lymphedema in an individual at risk for developing lymphedema. Modifications to a strength training program may be indicated. Adequate rest intervals are important between sets of exercise. The involved limb should have appropriate and sufficient compression from garments or bandages. The amount of compression may need to be adjusted to prevent an increase in swelling.

Aerobic Conditioning

The goal of aerobic conditioning (“cardio” exercise) is to improve or maintain cardiovascular fitness. Typically exercise is performed for a continuous period of time at 60% - 75% of the maximum heart rate (target heart rate). Target heart rate varies according to age and individual medical conditions. Methods of aerobic exercise include walking, jogging, cycling, and swimming. Aerobic exercise is beneficial for individuals with lymphedema. By improving cardiovascular fitness, overall health is improved. Increased deep respiration (deep breathing) enhances venous and lymphatic return.³ The risks of exacerbating lymphedema associated with aerobic exercise relate to increased blood flow and increased metabolic waste which can then trigger an increase in lymphatic flow and lymphatic load. Injuries associated with overuse such as tendonitis, bursitis, sprains, strains, blisters and skin abrasions are also concerns.

For Individuals at Risk for Lymphedema

Definition of Individuals at Risk for Lymphedema

People at risk for lymphedema are individuals who have NOT yet displayed signs and symptoms consistent with a diagnosis of lymphedema but have a known incapacity of their lymphatic system. This may include people who have undergone surgical disruption to a lymphatic node bed. In addition, receiving anti-neoplastic radiation therapy may also put an individual at an increased risk for developing lymphedema.⁴

Exercise Guidelines for Individuals at Risk for Lymphedema

The role of exercise is called into question when a patient is at risk for lymphedema but demonstrates no overt signs or symptoms of swelling in the at-risk extremity. It is widely understood and accepted that an increased lymphatic load may exacerbate or precipitate lymphedema in an unpredictable fashion in a population of affected or at-risk individuals. The lymphatic system is impaired after surgical and radiotherapy interventions. Although lymphedema may not be clinically evident, lymphatic drainage may be sub-clinically impaired⁵ predisposing the individual to the development of lymphedema. If not properly implemented and monitored, exercise activity, which increases arterial blood flow to an extremity, can result in an increase of the lymphatic load and may induce lymphedema in an extremity

An inflammatory response experienced in an extremity will also increase arterial blood flow to this extremity. If an overuse syndrome is experienced during an exercise program, inflammatory mediators will contribute to an increase in the lymphatic load. Fluid accumulation in the interstitial tissue may result if the lymphatic system is insufficient to manage the increased load; swelling may then occur.

Based on the above outlined physiological responses, it is reasonable to recommend that individuals entering an exercise program, who are at risk for developing lymphedema, utilize a well-fitted compression garment on the limb at risk during their exercise intervention. Use of the garment will increase the interstitial pressure of the extremity and decrease the ultrafiltration rate at the capillary level, enabling the lymphatic system to maintain an adequate level of fluid resorption which will likely prevent an accumulation of excess lymphatic fluid in the interstitium. It is recommended that individuals at risk for developing lymphedema seek information regarding lymphedema and its early warning signs of swelling from a qualified lymphedema specialist.

Unfortunately, at this time there is no reliable method to detect sub-clinical lymphatic impairment, or to predict which individuals will develop clinically evident lymphedema in the at-risk group. This has contributed to a difference of opinion among clinicians related to the use of compression garments during exercise in individuals at risk. While the physiological response supports the use of compression in individuals at risk, this has not been clinically studied. Although endorsed by some clinicians, it remains unclear whether the person at risk for lymphedema should wear compression garments while exercising, and whether the use of compression garments during exercise by individuals at risk for lymphedema will prevent lymphedema.

Compression Garment Guidelines for Individuals at Risk (Excerpted from the NLN Air Travel Position Statement)

For individuals who may wish to obtain a compression garment for exercise, the following guidelines are recommended:

- Be measured for and obtain a well-fitted compression garment
- Obtain compression of at least 20-30 mmHg for upper extremity support. A hand piece, either a glove or gauntlet is absolutely necessary and should be worn with the compression sleeve.
- Obtain compression of at least 30-40 mmHg for lower extremity support.

Key Points to Remember Regarding Exercise

- Before starting any exercise program individuals should be medically cleared.
- In individuals with lymphedema, adequate compression should be utilized. Either compression bandages during Phase I CDT, or compression garments during Phase II CDT are appropriate. When swimming or exercising in water, compression garments are not needed on the lymphedematous limb if it is submerged. The properties of water will provide some compression.
- Individuals at risk for developing lymphedema may wish to consider obtaining a well-fitted compression garment for the limb at risk, prior to beginning an exercise regime.
- Good hydration should be maintained while exercising.
- When exercising outdoors a cooler time of day should be selected, and overexposure to heat and sun minimized or avoided.
- Individual responses to exercise may vary. Modifications to an exercise program may be indicated to meet individual medical needs and response to swelling.
- Performing activities or exercise in excess of the usual duration and intensity may trigger or worsen lymphedema.

- Exercise should be started gradually. The exercise routine should be stopped if pain or an uncomfortable sensation results, especially if this occurs in the affected limb or the limb at risk. Strain or overuse should be avoided.
- Before initiating a strength training program, consultation with a lymphedema specialist is recommended. The swelling from lymphedema should be adequately managed prior to engaging in strength training.
- Many daily activities (at home and at work) may cause the same effects on the lymphatics as exercise and may require modification.

Summary

Exercise as a sole intervention is not efficacious in decreasing limb volume in individuals with lymphedema.⁶ Exercise programs should be individualized based upon a person's health history, prior activity level, lifestyle, and exercise preferences. The risks and benefits of exercise may vary depending on many factors. These should be considered when participating in any exercise/activity. Most exercise can be modified to maximize the positive effects and minimize the negative effects on the lymphatic system. Appropriate compression should be utilized in individuals with lymphedema when engaging in exercise routines.

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