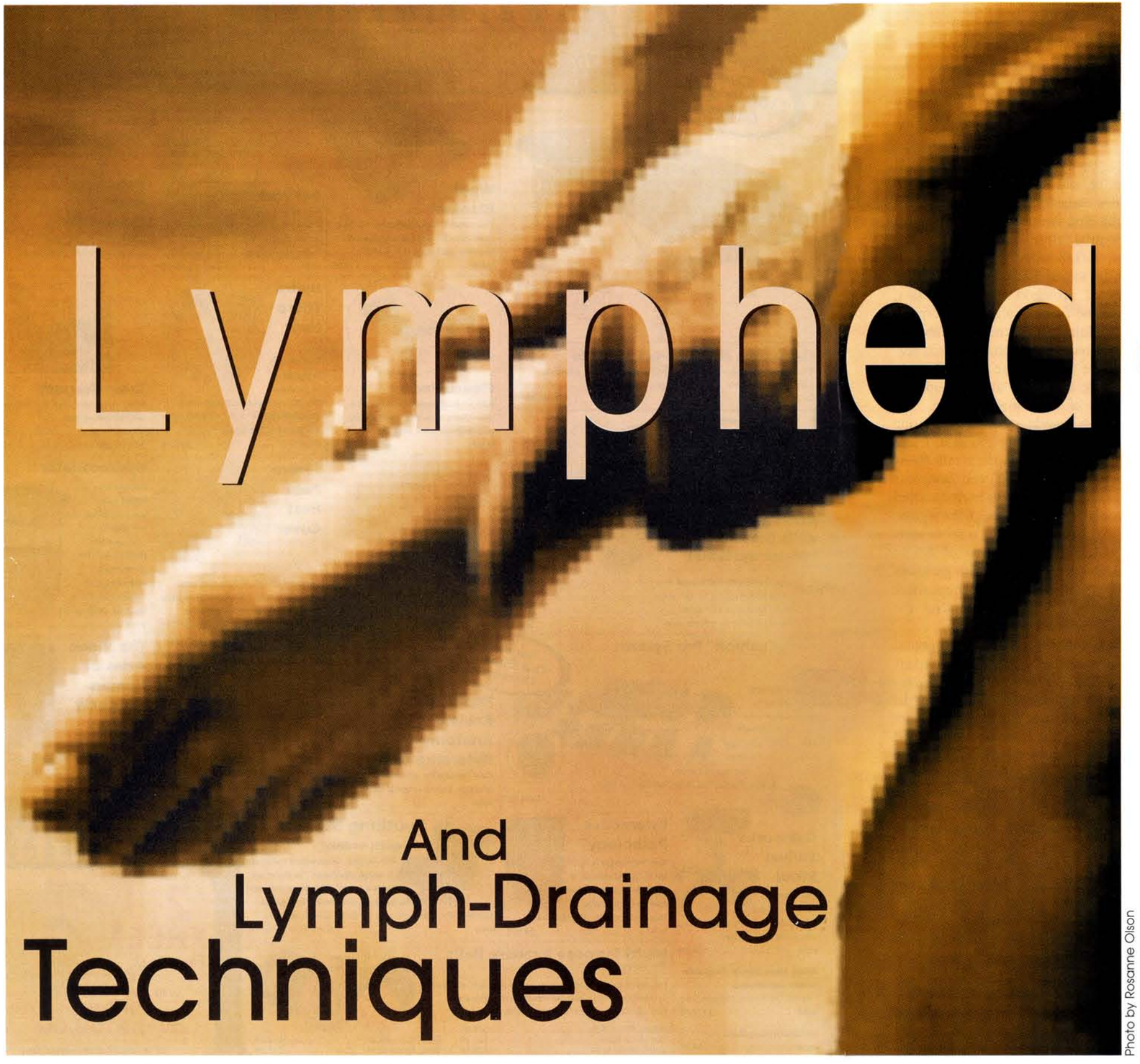


Lymphedema And Lymph-Drainage Techniques

Photo by Rosanne Olson

Massage therapists can use these methods to ease the painful symptoms of this serious condition.

BY BRUNO CHIKLY AND SUE WELFLEY

Betty is a breast cancer survivor. Since the 72-year-old Florida woman found a lump in her right breast four years ago, Betty has had a mastectomy, radiation treatments, chemotherapy and exploratory surgery. She willingly accepted these therapies as necessary to stay alive. But neither she nor her health-care providers were prepared for the profound swelling that developed in her arm, which compromised her health and affected the quality of her life. Fortunately, Betty found a massage therapist who is knowledgeable about lymphedema and lymph-drainage techniques. With the improvement in her condition through hands-on therapy and self-care, Betty now feels more in control and better able to manage this chronic condition.

Glossary For Lymphedema

Congenital or connatal: present at birth.
Cellulitis: inflammation of the "cellular" conjunctive tissue (usually the subcutaneous tissue).
Dermatolymphangioadenitis (DLA): another term for cellulitis/lymphangitis; inflammation of the skin, lymphatic vessels and lymphatic nodes.
Edema: from the Greek "oidema" is defined by a condition where there is an excessive accumulation of tissue fluid (hydrocolloid) in a local or generalized part of the body.
Erysipelas: infection of the skin caused specifically by the A beta-hemolytic streptococci (cf. cellulitis).
Intercellular spaces or interstitium: the potential space between cells in the organ and tissues of the body.
Lymphangitis: inflammation of lymph vessels.
Lymphocyte: lymph cell, part of the white cells of the body.
Lymphology: the science that studies the lymphatic system.
Lymphostatic edemas = high-protein edemas = lymphedema: Lymphostatic edema is caused by a deficit in lymphatic transport capacity. In lymphostatic edemas, the lymphatic vessels themselves are not properly working. These edemas also are described as Low Output Failure or low volume mechanical lymphatic insufficiency or lymphedema.
Lymphotome (sometimes called territories): from "tome" or incision. A segmental area of the skin that is drained by the same node group. The lymphotomes are separated by watersheds.
Septicemia: general infection, presence of bacteria in the blood.

Swelling, or edema, is defined by an excessive accumulation of tissue fluid (hydrocolloid) in the body (interstitial compartment). When the lymphatic pathways are obstructed and fluid accumulates, lymphedema results. Lymphedema is defined as a mechanical insufficiency in the transport capacity of the lymphatic system. It can become especially severe as a result of the long-term accumulation of plasma proteins, chronic local infection and production of fibrotic tissue.

Lymphedema is categorized as either primary or secondary (Kinmonth, 1957). While primary lymphedema conditions are abnormalities of the lymphatic system due to unknown causes, secondary lymphedema is swelling caused by known factors, such as surgery, radiation treatment or infection. The most frequent cause of secondary lymphedema in the United States is the removal of axillary (armpit) lymph nodes and radiation therapy that follows mastectomy. These procedures are among the commonly used treatments for breast cancer, which is the second-leading cause of death for women in this country. Depending on the study cited, between 5 percent and 40 percent of patients receiving this type of breast cancer treatment develop lymphedema. (See *Table* 1, Page 84.) Yet information about conservatively applied manual techniques, such as lymphatic drainage, to alleviate lymphedema and other types of edema are not well known in the United States.

Understanding The Lymphatic System

Medical science, in fact, is only beginning to fully understand the role that lymph plays in the body, even though the lymphatic system was identified in 1622. The lymph is a fluid that originates in, and flows through, the connective tissue spaces of the body. Once in the first lymphatic capillaries, this interstitial fluid, or pre-lymphatic fluid, is officially called "lymph." It absorbs excess fluid, macromolecules (trapped proteins), microorganisms, toxins and foreign substances from the extracellular compartments. Through this process, the lymphatic system regulates the fluid volume and pressure in the body, and helps maintain optimal integrity of the connective tissue.

Lymph travels steadily from one region of the body to the next, transporting immuno-competent cells (lymphocytes, macrophages) and numerous other substances, such as hormones and electrolytes. Passing through the regional lymph nodes, this fluid is concentrated and filtered. The flow of lymph through lymphatic nodes also generates production of about one-third more lymphocyte cells that stimulate the body's immune response.

Radiation therapy, as well as surgical excision of the lymph nodes, impairs the natural removal of fluid (physiological lymphatic drainage) from the connective tissues. This frequently gives way to lymphedema of the affected areas, particularly the chest, breast and upper extremities. Generally, if the swelling measures 2 to 3 centimeters greater than the uninvolved limb six weeks after the surgical procedure, the condition may be considered lymphedema. (See *Table* 2, Page 84.) More than 22 percent of lymphedema cases appear three years after surgery (Heitman, 1978); although, cases of lymphedema have been reported up to 30 years later.

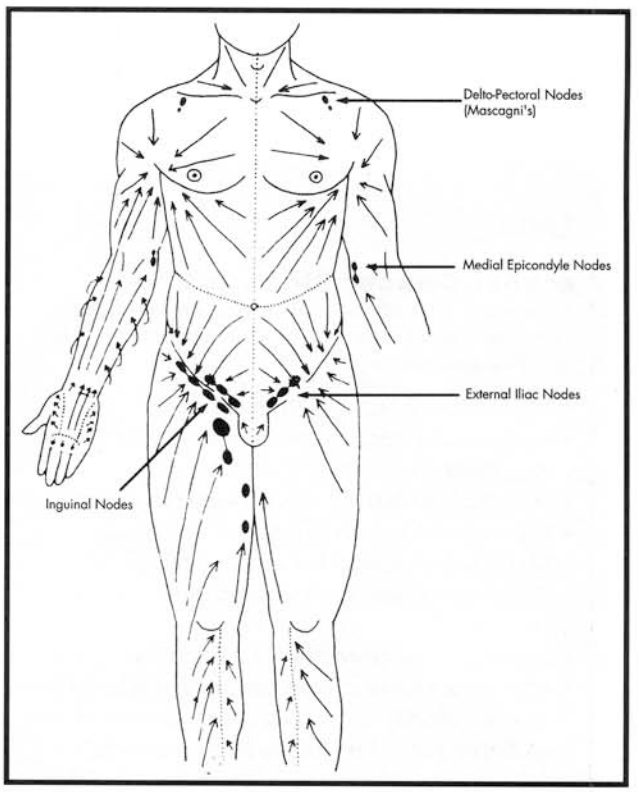
Lymphedema Case History

Through breast self-exam, Betty found a lump in her right breast in October 1993. In November, she had a mam-

mogram followed by a biopsy of the lump, which tested positive for cancer. Betty willingly agreed to immediate surgery, and, on Dec. 6, 1993, her right breast and 15 axillary nodes were removed. Even though all the tissues and nodes tested negative for cancer, Betty's physician recommended radiation therapy as a precaution due to the type and size—approximately 7 centimeters—of the lump. Betty had 28 radiation treatments during January and February 1994.

At that time, she should have been advised of precautions concerning her affected upper extremity and chest. She was not advised of any contraindications concerning her daily activities. In lymphedema cases, there are many precautions that patients should respect as they are at risk throughout their lives. Because lymphedema causes stagnation of a protein-rich liquid, this condition can breed bacterial infections, such as streptococcus or staphylococcus. In addition to being attentive to skin care, the main objectives are to avoid the four "I"s on the affected side of the body: injury, infection, increase in temperature and increase in pressure.

Five months later, Betty noticed a swelling of her right arm. She later recalled lifting many boxes at a local craft show at that time. Over the next several months, the swelling decreased slightly. However, by October 1994, the arm began to swell excessively. In her



The superficial (epifascial) lymph circulation generally converges in healthy patients toward the two main groups of nodes: axillary (armpit) and inguinal (groin).

Table 1

Breast Cancer Statistics

Between 5 and 40 percent of women undergoing commonly used treatment for breast cancer will develop lymphedema.

According to the National Cancer Institute:

- Breast cancer accounts for 39 percent of all cancer diagnosed in women;
- More than 186,000 U.S. women were diagnosed in 1997;
- 78 percent of women diagnosed are over 50;
- 84 percent will survive five years;
- 97 percent will survive if local and detected early.

According to the American Cancer Society:
The five-year survival rate (women living five years after diagnosis is made) of localized breast cancer has risen from 72 percent in the 1940s to 97 percent in 2001.

mind, Betty felt that this might have been related to using a manual screwdriver to open a crated piece of furniture.

When Betty returned to her physician, he did not diagnose her condition as lymphedema. The doctor was concerned about a reoccurrence of the cancer. The physician's advice was to wait and see what develops; no treatment was suggested. The swelling continued in the right arm.

In March 1995, a needle biopsy was performed on a small mass in the right axillary area, which showed no cancer. Between March and June, an ultrasound was performed on the right arm and axillary area. An MRI was taken and CAT scan with guided needle biopsy was performed. All tests again were negative for cancer. The right arm continued to swell. The physician was certain that cancer cells were indeed causing the swelling, even though there was no scientific evidence to confirm it.

The physician ordered chemotherapy to fight the assumed cancer. Aware of no other options, Betty agreed to the treatment. From June through August 1995, she received eight chemotherapy treatments. The small mass under her right arm seemed unaffected by the treatment.

The surgeon then ordered exploratory surgery of the right axillary area. He was convinced that the cancer had reoccurred. In September 1995, more breast tissue and three lymph nodes were removed. Again, all tissues and nodes tested negative for cancer. During a follow-up visit, the physician suggested that a sequential pressure pump be used to reduce the swelling in the arm. (Coincidentally, the day before Betty's appointment, an in-service lesson on use of the pump and lymphedema was held at the physician's office.)

Betty was instructed to use this pump daily, for one hour once or twice a day, increasing to two hours per treatment. She also was measured for a compression garment (sleeve) to be worn while not using the pump.

Betty found using the pump to be very uncomfortable. Her questions to the physician's staff went unanswered, and she became very frustrated. However, she did continue using the pump because she was not aware of any other alternative therapies.

After several weeks of this treatment, Betty noticed a limited decrease in her forearm edema, but swelling had increased in the right shoulder and trunk area. She experienced noticeable limited range of motion, which included difficulty in bending the elbow to eat or for personal care, such as toothbrushing. Betty was unable to find clothing to fit the affected area. She also had weakness in the arm and a severe decrease in muscular strength. Although right-handed, Betty attempted to use her left hand and arm as much as possible. Her energy level was very low, and she experienced several occasions of depression because she was not able to perform normal daily activities.

Lymphatic-Drainage Techniques/Manual-Lymph Techniques

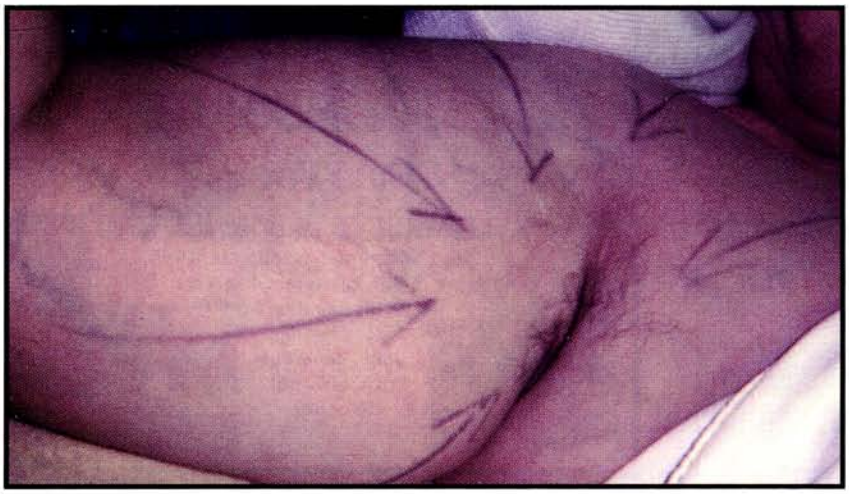
At the time of her first session, Betty was experiencing moistness on her right forearm, which had been noticeable over the past few days. This fine, clear, jelly-like substance often is incorrectly identified as sweat. It is, however, interstitial liquid exiting through the pores, which is a common occurrence once the skin of the affected area is stretched to its maximum capacity. Because this liquid contains protein, seepage can breed bacteria and lead to infection. After the first lymphatic drainage session, the moistness disappeared and did not return.

Lymphatic drainage techniques involve the use of subtle manual maneuvers to aid in the recirculation of the lymphatic flow.

Table 2

The Medical Classification Of Lymphedema

Subclinic state: Latent stage.
Stage 1: Completely and spontaneously reversible lymphedema. This usually is characterized as pitting edema (edema that retains the indentation of a finger after pressure is applied) or soft edema, with little or no fibrosis.
Stage 2: Spontaneously irreversible edema. It can be corrected with lymphatic drainage; there is very little pitting, chronic inflammation and fibrous tissue.
Stage 3: Irreversible lymphedema. It describes fibrosis and hardening of the skin, very hard edema and no skin movement. This can evolve to an "elephantiasis limb."



This is the superficial Manual Lymphatic Mapping (MLM) of the unaffected left upper arm; the medial aspect was done before the session. All the circulation converges toward the healthy axilla.

The specific method used in Betty's case was Lymph Drainage Therapy℠ (LDT), an original method developed by this author (Chikly) that incorporates knowledge from years of practice in general medicine, osteopathy and oriental medicine. Its concepts are based on traditional lymphatic drainage procedures as conceived by Alexander de Winiwarter (Belgium, 1891), osteopath F. P. Millard (Toronto, 1922) and Emil Vodder (Europe, 1936). The LDT process, however, is the first to use techniques of manual listening to teach practitioners to identify the specific rhythm, direction and quality of the lymph flow in the body. (See *Table* 3, opposite page.) This enables advanced practitioners to perform lymphatic mapping before and after the session to manually identify the most accurate alternative pathways for drainage.

Lymphatic drainage techniques are effective in relieving lymphedema because the existing lymph flow, which no longer has lymph nodes to drain into, is stimulated to find alternate pathways and remap themselves to functioning lymph nodes. Once the lymph flow has been directed to functional lymph nodes, it then can be drained from the affected area to new, healthy lymph territories or lymphotomes. Because the lymph vessels mainly are located just under the epidermis of the skin, skilled practitioners trained in LDT can easily determine the direction, as well as the rate, of lymphatic flow through palpation. Very little pressure is needed for assessment or drainage. The amount of pressure generally used is less than one ounce per square centimeter. (See *Table* 4, opposite page.)

While pressure pumps and compression sleeves are commonly employed in the United States for diagnosed lymphedema, lymphedema specialists outside this country virtually abandoned the use of pumps. Compression sleeves applied without manual therapy seem to provoke more fibrotic tissues (Feria, 1992) and can lead to irreversible lymphedema in the affected upper extremities and chest.

Betty continued LDT for two weeks with a consistent, limited reduction of the swelling in the arm. LDT sessions were increased to three to five times a week, followed by compression bandaging. The arm continued to reduce in swelling. Measurements of Betty's arms were recorded using the Gulick II tape measure. The length of the arm was marked every 4 centimeters, beginning with the styloid process and continuing to the axilla fold. The circumference was then measured at each mark, and a mathematical formula was used to determine the actual volume of fluid in the arm. From November 1996 through February 1997, the fluid volume in Betty's right arm was reduced a total of 1.05 liters.

Protocol For Lymphedema

Manual therapy is just one of the tools used to address the complex problem of lymphedema. There are, in general, two phases of combined care recommended for this often-chronic condition. As yet, no consistent protocol for lymphedema has been established in the United States.

Phase I—Acute decongestion:

1) Skin care/respect general precautions.

2) Manual Lymph Techniques (MLT)/Lymph Drainage Therapy.

3) External compression (bandaging).

4) Psychological and stress management.

5) Self-drainage/self-bandaging.

6) Isotonic exercises/breathing exercises.

7) Diet/weight loss, if needed.

Phase II—Maintenance. Even more self-care is required from the patient during this phase. A more comfortable custom-made garment, either a sleeve or stocking (for edema of the legs), replaces bandages. They are used to sustain results of Phase I.

Betty was instructed in daily exercises to increase range of motion of the arm and shoulder, as well as to strengthen the muscles. She also was taught self-bandaging techniques, advised to exercise while the limb was bandaged and take scrupulous care of the skin and nails to prevent infection. She was advised of the contraindications for use of the arm. One of the main complications to watch for is infections/cellulitis. The inflammatory process often starts from a break in the skin and proceeds along lymphatic vessels to regional lymph nodes. Approximately 25 to 40 percent of patients with lymphedema develop infections.

Betty continues to self-bandage every night with compression bandages, while she wears a compression sleeve during the day. She continues daily exercises with the compression bandages on her arm, as well as performing daily skin care. She receives LDT once every three to four weeks as part of her maintenance program. Patient compliance in self-massage, bandaging, exercise and skin care is crucial in maintenance of lymphedema.

Table 3

Specifics To Lymph-Drainage Therapy℠ (LDT)

- Manually feeling the rhythm and direction of the lymph flow.
- Manually feeling the quality (sticky or fluid) and depth of the lymph flow.
- Manually mapping the lymph flow in order to assess its direction before and after the session.
- Stimulating superficial and deep circulation. Drainage of the lymph and interstitial liquid of all viscera, muscles, bones, periosteum, as well as every articulation of the body including the cranial sutures.
- Accessing the emotional component of body fluids.

Betty continues to improve the condition of her right arm, as indicated by measurements taken every four visits.

"The massage therapy (LDT) and compression bandaging done five days a week for the three-week period resulted in the most significant decrease in swelling of the arm," Betty says. "More physicians should be aware of this therapy, so they can refer their patients to qualified massage therapists when their arms begin to swell, rather than waiting and telling them to live with it."

Although lymphedema usually cannot be eliminated, the application of LDT/MLT, along with compression bandaging, can allow the patient to return to his or her normal daily activities in a timely manner.

Commentary

Fortunately, Betty's lymphedema is improving. However, many other cases of lymphedema in the United States go undiagnosed or are ineffectively managed. This is due, in part, to a lack of knowledge among many health-care providers—including massage therapists—of lymphedema and the benefits of lymphatic drainage techniques to arrest the condition. Much needs to be done to educate health-care professionals about lymphedema. Additional scientific studies, too, are needed, particularly concerning treatment protocols in the United States.

Due to the chronic nature of the condition, patient self-care is critical to the successful treatment and continued maintenance of lymphedema. Effective intervention for lymphedema cannot be achieved without the patient's commitment to compliance.

Another obstacle to patients obtaining manual lymphatic drainage, as a component of their lymphedema care, is the cost. Some insurance companies and Medicare are willing to pay up to $6,000 for a sequential pump, even though lymphedema specialists are increasingly abandoning this approach. Yet there often is no insurance coverage for manual therapies, regardless of the lower costs, generally less than one-third that of the pump. In October 1997, Medicare in Florida began covering manual lymphatic drainage as part of Complex Decongestive Physiotherapy (CDP) in treatment of lymphedema. Therapists who have completed specialized training in CDP may qualify to participate in Medicare reimbursement. Medicare Part B has a cap of $900 on CDP treatments.

Above all, we must remember that lymphedema—a medical condition with many potential complications—should be addressed with a multidisciplinary approach, including the cooperation of a licensed physician. Much can be done to benefit those who are affected by lymphedema.

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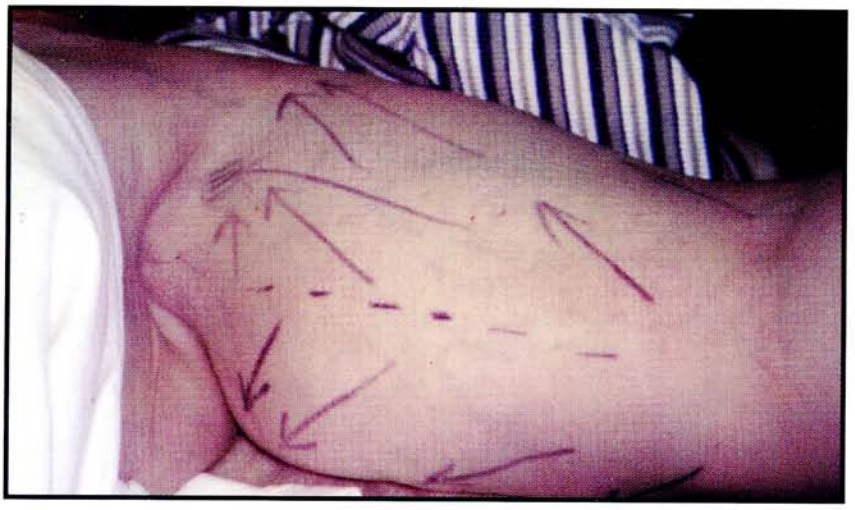
Table 4

Steps Necessary To Reroute Stagnant Lymph In Lymphedema

Step I: Drainage of the "healthy pathways" surrounding the affected areas.
Step II: Rerouting the edematous areas of the chest and/or abdominal regions.
Step III: Rerouting of the proximal areas of the limb.
Step IV: Safe drainage of the whole limb.



Right affected upper extremity: The lymph flow diverges from the axilla and seeks alternate pathways. We can see that an area of the upper extremity still drains toward a little area of the axilla (see little circle in the upper axilla with two arrows converging). The rest of the arm will diverge (and do not converge anymore) away from the axillary region.

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