

JP's medical history included complications associated with carpal tunnel and Raynaud's syndromes. Following carpal tunnel surgery in 1998, she contracted a staphylococcal infection. In September of the same year, she was seen in the emergency room for a ruptured ovary. A diagnosis of ovarian cancer soon followed. Her cancer treatment included a radical hysterectomy with dissection and removal of 36 lymph nodes.<sup>4</sup> Early in 1999, after recovering from surgery, she began a four month course of follow-up chemotherapy. A series of post-treatment complications, including wound infection, septicemia, and kidney malfunction required hospitalization.

In July, 2001, after a two year remission from ovarian cancer,<sup>5</sup> JP contracted an infection resulting in severe inflammation in her left lower extremity. A consultation with her physician led to a diagnosis of cellulitis. When recommended antibiotic treatment and bed rest proved ineffective, JP visited her oncologist and was diagnosed with lymphedema.

In September 2002, JP visited a lymphedema clinic for an initial evaluation. She presented with bilateral pitting edema and a 21% maximum circumferential difference between her left and right lower extremities. She reported a pain level of seven on a scale of ten. Because of that pain, she was unable to walk farther than fifty feet. Physical examination revealed lymphatic fluid leakage in her left lower extremity and her tissue was firm and tight to the touch. Fibrosis was present at the ankle. JP stated that, within minutes of standing without wearing a compression garment, she experienced throbbing pain in her left leg.

Following evaluation, JP received seven one-hour manual lymph drainage (MLD) massage therapy sessions in the clinic over a period of three weeks.<sup>6</sup> She improved and the treatments were discontinued. Her edema had been reduced and she reported a minimal level of pain at between one and two on a ten point scale. JP's therapist concluded that she was doing well with independent self-management at home using a regimen that included self-MLD therapy, compression wrapping and compression stockings.

Less than a year later, in July 2003, JP returned to the lymphedema clinic because new health limitations prevented her from adequately maintaining her in-home lymphedema therapy regimen. Because of the physical demands of self-MLD, she was experiencing exacerbations of both carpal tunnel syndrome and Raynaud's syndrome in both hands. Her edema had relapsed as well. Both edema and pain had worsened and her left lower extremity was red from ankle to groin. Her left buttock and both legs were visibly more edematous than when she was last seen in the clinic.

Although both limbs were swollen, lower extremity girth measurements showed a maximum of 36.2% difference between the left and right legs. The pain level in her entire left lower extremity had increased from two or less to five on the ten point scale. A decision was made to resume in-clinic MLD therapy and compression wrapping until a better solution could be found. Soon thereafter, the patient's therapist recommended the Flexitouch Lymphedema System.

The Flexitouch system uses a two phase preparation and drainage sequence. This sequence, along with other design features such as narrow curved chambers and the 1-3 second timing of the application of slight pressure follow the principles of MLD therapy.<sup>8</sup> MLD techniques are based on the anatomy and physiology of the lymphatic system.<sup>9</sup>

JP discontinued in-clinic therapy and began using the Flexitouch system late in September, 2003. She used the device twice daily for an hour each session.

The Flexitouch Lymphedema System is designed for use in the home as part of continued lymphedema maintenance therapy. Equipment consists of an electronic controller unit and garments designed to accommodate the affected areas.<sup>7</sup>

Since initiation of Flexitouch therapy, JP reported using the system almost daily. She expressed her satisfaction with the long-term results of Flexitouch therapy and her belief that, given her complicated medical history, the device had allowed her to achieve and maintain the most normal lifestyle possible.\*\*

Because this is a case report and not a formal, controlled study, it is difficult to assess in quantitative terms the precise contribution of the Flexitouch system to the rapid, sustained results experienced by this patient. Nevertheless, the dramatic clinical, physical and quality of life gains documented in this case are a compelling demonstration of the therapeutic benefits of the Flexitouch system in this patient.

After seven weeks of treatment with the Flexitouch system, JP's edema was reduced by 42%. After eight weeks, she reported that she could see her ankle for the first time in over a year. After 16 weeks, her edema was reduced by 46%. JP continued to improve incrementally with diligent use of the Flexitouch system. After six months of treatment, measurements showed that her edema had decreased by 65%. One year follow-up illustrates JP's ability to effectively maintain her lymphedema at home as she sustained an 81% reduction in edema volume (2.9 liters) since initiating Flexitouch therapy.

After two and a half years of Flexitouch therapy, JP continues to successfully maintain her edema reduction using only the Flexitouch system and compression garments. During this interval, no further in-clinic MLD had been required, and she had been able to eliminate use of compression wrapping.\* During this time, no lymphedema-related hospitalizations had been necessary.

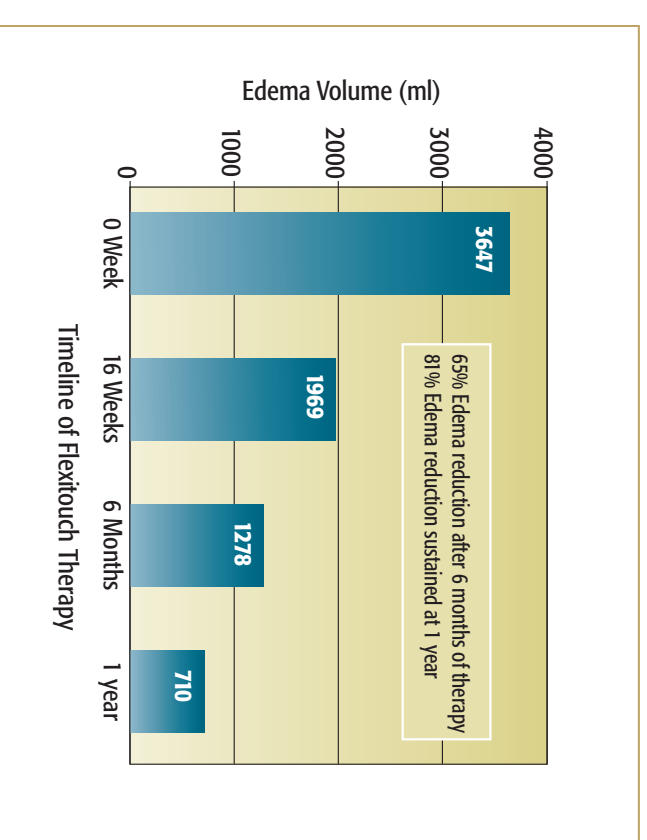
\* The Flexitouch system is not intended to replace the use of compression bandages or garments. Please consult your treating clinician before making any changes to your lymphedema treatment regimen.

\*\* Individual results will vary.

- 1) Tiwari A, Cheng KS, Burton M, Myint F, Hamilton G. Differential diagnosis, investigation, and current treatment of lower limb lymphedema. Arch Surg. 2003 Feb; 138(2):152-61.
- 2) Moffatt CJ, Franks PJ, Doherty DC, Williams AF, Badger C, Jeffs E, Bosanquet N, Mortimer PS. Lymphedema: an underestimated health problem. Q J Med 2003; 96: 731-738.
- 3) Szuba A, Rockson SG. Lymphedema: Classification, diagnosis and therapy. Vasc Med 1998; 3: 145-156.
- 4) Karakousis CP. Surgical procedures and lymphedema of the upper and lower extremity. J Surg Oncol. 2006 Feb 1; 93(2): 87-91.
- 5) Rubin SC, Randall TC, Armstrong KA, Chi DS, Hoskins WJ. Ten-year follow-up of ovarian cancer patients after second-look laparotomy with negative findings. Obstet Gynecol. 1999 Jan; 93(1): 21-4.
- 6) Ko DS, Lerner R, Klose G, Cosimi AB. Effective treatment of lymphedema of the extremities. Arch Surg. 1998 Apr; 133(4):452-8
- 7) Tactile Systems Technology, Inc. <http://www.flexitouch.com/html/howlegworks.html>
- 8) Dedeker K, Waldrige I. Lymphedema Management. Advance for Dir. of Rehab. 2005; August: 49-52.
- 9) Bernas M, Wirtz M, Kriederman B. Massage therapy in the treatment of lymphedema. IEEE Eng Med Biol Mag. 2005; 24(2):58-68.

# CASE STUDY

## JP – Moderate Left Leg Lymphedema



### ABSTRACT

A 40-year-old woman suffered from moderate lymphedema in her left leg following treatment for ovarian cancer.<sup>1,2,3</sup> As the severity of her edema worsened, her therapist recommended the Flexitouch® Lymphedema System. The patient began using the Flexitouch system in September, 2003. Within six months, her edema decreased by 65%. After one year of Flexitouch usage, JP’s edema volume was reduced by 81% or 2.9 liters. JP has used the Flexitouch system for over two years and continues to successfully maintain her edema reduction using the Flexitouch system and compression garments.\*

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