Lipedema and lipolymphedema.

Support lymphatic function to reduce edema and alleviate symptoms.

Tactile MEDICAL®

Lipedema and edema.

Lipedema: common but commonly overlooked.

Lipedema is a loose connective tissue (adipose) disease[1] believed to affect one in nine adult women.[2] The hallmark of lipedema is symmetrical fatty tissue buildup in the lower body and arms, sparing the hands and feet. Lipedema almost exclusively affects females and often develops in times of hormonal change.[1]

Despite its prevalence and distinct manifestations, clinicians commonly mistake lipedema for lymphedema or obesity, or dismiss it as the product of poor diet or lack of exercise. Though lipedema may be combined with lymphedema or obesity, it is a distinct chronic condition which is resistant to management through diet, activity, or bariatric surgery.[2,3] Little is known about its etiology, and lipedema does not have a unique biomarker or a medical cure.[1,4]

Because lipedema is poorly understood and lacks a cure, lipedema patients may feel helpless. But there are widely accepted treatment options aimed at reducing lipedema symptoms.[1,5] This document focuses on the role of pneumatic compression devices (PCDs) as a component of lipedema therapy.

The pathology of lipedema and lipolymphedema.

Lipedema's molecular drivers remain largely unknown.[3] Its chief characteristics are adipocyte hypertrophy and hyperplasia disproportionately affecting certain body regions *(page 4)*, accompanied by thickening of the interstitium and increased interstitial fluid.[2] The lymphatic system may be capable of removing increased fluid in the early stages of lipedema; if not, the presence of edema reflects overwhelmed lymphatics.[2] Lipedema is marked by lymphatic dysfunction, which increases in later stages.[1] The combined condition of lipedema and chronic swelling is known as lipolymphedema, which may include foot swelling and other well-known signs of lymphedema (LE).[6]

> "Treatments aimed at supporting lymphatic flow are useful adjuncts in managing lipedema; this includes complete decongestive therapy and the use of home sequential pneumatic compression devices such as the Flexitouch® system." – KAREN HERBST PHD, MD

Treatment and improving lymphatic flow.

Conservative lipedema treatments.

Lipedema care should be multi-pronged *(Fig. 1)* and address pain, nutrition, and psychological distress as well as symptom management.[5] One of the cornerstones of lipedema care is improving lymphatic flow.[1,5] Swelling from impaired lymphatic flow may be present in early lipedema but is most pronounced in lipedema's latter stages.[8] While much remains unknown about lipedema, it is well known that fluid buildup in swollen limbs must be removed through lymphatic channels, regardless of its cause.[9]

Multi-pronged approach to caring for lipedema.

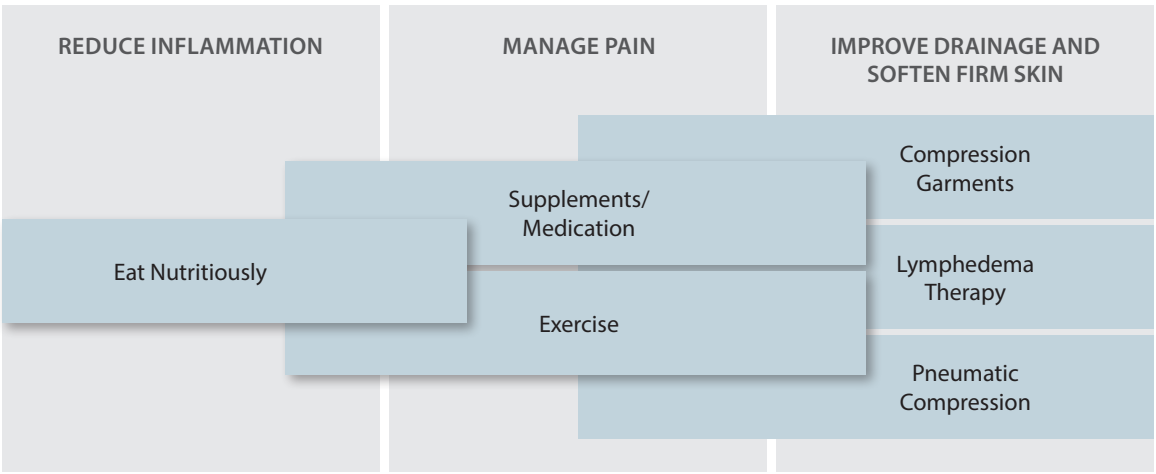


Figure 1

Improving lymphatic flow and softening fibrosis.

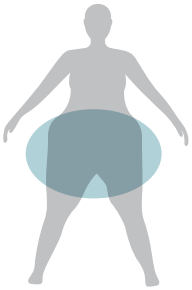
As with LE, conservative treatment aimed at improving flow for lipedema patients consists of complete decongestive therapy (CDT) and ongoing patient care. CDT includes therapist-directed manual lymphatic drainage (MLD) to remove fluid and use of compression garments to maintain fluid reduction gains. During the ongoing at-home phase of treatment, PCD therapy helps automate self-manual lymphatic massage in combination with continued use of compression garments.[2] Another aim of both MLD and PCD therapy is to soften fibrosis.[10,11]

PCD therapy will not reduce adipose tissue but can be an important addition to patient-managed care.[1,2,12,13] The 2021 US Standard of Care document for lipedema[1] provides a strong recommendation for use of pneumatic compression based on grade A evidence that PCDs stimulate lymphatic flow and are an option for at-home lipedema and lymphedema care.

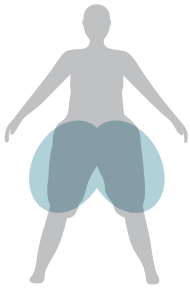
Reducing static protein-rich interstitial fluid within a swollen limb decreases the propensity to develop chronic inflammation, fibrosis, recurrent infection and fat deposition.[14-17] PCD therapy has been shown to reduce fibrosis in lower extremity LE patients.[11] Pneumatic compression to reduce swelling in lipedema patients may also reduce pressure-related pain,[13,18] which may help to improve mobility.[12] Given the involvement of pain in lipedema,[1] careful consideration should be given to patient selection for PCD therapy and selection of an appropriate device.[13] PCD therapy may be difficult for some patients to tolerate unless it is applied at low pressures.

Lipedema types and staging.

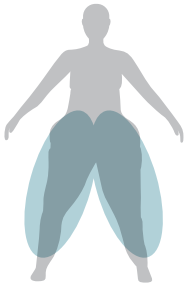
TYPES OF LIPEDEMA



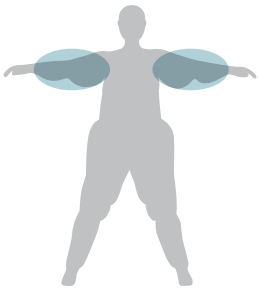
Type I
Buttocks



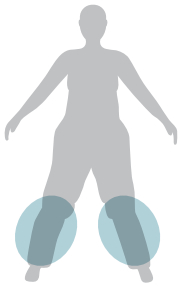
Type II
Buttocks,* hips, thighs



Type III
Buttocks,* hips, thighs, calves



Type IV
Arms



Type V
Calves

**Note: swelling above the thighs involving the buttocks is appropriate to document as proximal or truncal swelling.*

STAGING OF LIPEDEMA[1]

Lymphedema can occur at any stage of lipedema and should be staged separately according to International Society of Lymphology (ISL) criteria.[7]

STAGE I

Skin has a smooth texture with pebble-like feel due to underlying loose connective tissue fibrosis

STAGE II

More lipedema tissue buildup, skin develops indentations, may have larger and more numerous palpable nodules

STAGE III

Increased lipedema tissue, more fibrotic in texture, with numerous large nodules and hanging lobules of tissues

Differential diagnoses and edema.

Differential diagnoses.

The characteristics provided in this table can be used to differentiate lipedema, lymphedema and obesity when they occur in isolation. However, these conditions can commonly occur concomitantly. Lipolymphedema is discussed below. *Shading denotes areas of potential overlap between conditions.*

Characteristic	Lymphedema	Lipedema	Obesity
Gender	Male or female	Almost exclusively female	Male or female
Age at onset	Birth to adulthood *(primary)*; adult *(secondary)*	Usually 10–30 years	Childhood onward
Family history	Possible *(primary)*	Common	Very common
Areas affected	May be unilateral or bilateral depending on cause	▪ Bilateral, usually symmetrical ▪ Most frequently affects legs, hips and buttocks; may affect arms ▪ Feet/hands commonly spared	▪ All parts of the body ▪ Usually symmetrical
Effect of dieting	Proportionate fat loss from trunk and affected limbs	Weight loss is much less in lipedema sites	Weight reduction, uniform loss of fat
Effect of limb elevation	Less effective as staging increases	Absent or minimal	No
Pitting edema	Present in early stage; typically absent in later stages	Absent or minor in the early stages of the disease	No
Pain/discomfort	▪ Can include modest pain ▪ Not hypersensitive to touch	▪ Often ▪ Hypersensitive to touch	No
Bruises easily	No	Yes	No
Skin consistency	Minimal thickening early stage; fibrous and nodular late stages	Normal or soft/loose *(unless lymphedema present)*	Normal
History of cellulitis	Often	Unusual *(unless lymphedema present)*	Unusual
Stemmer's sign	Negative early; positive late	Usually negative *(unless late stage lymphedema present)*	Usually negative

**This table was compiled from multiple sources with editorial guidance from Dr. Karen L. Herbst and Dr. Steven M. Dean.*

Lymphatic involvement in lipedema, lipolymphedema.

The presence of edema reflects compromised lymphatics or lymphatic dysfunction. Lipolymphedema should be considered when a lipedema patient has either transient orthostatic edema, permanent foot/toe swelling, and/or skin hardness/nodularity.[1] In a recent database review of 440 patients with lower extremity LE, 12% had lipolymphedema, including 71% with stage II LE and 17% with stage III LE.[19] Abundant radiological evidence utilizing magnetic resonance imaging or lymphoscintigraphy has documented the association of lipedema and LE.[8,20-23] Though LE is more likely to complicate later stages of lipedema, it is noteworthy that LE can occur in any stage of lipedema.[8,20] A 2020 study[24] identified that a biomarker for LE is also elevated in lipedema patients, further supporting the association between these two disorders.

The 2021 US standard of care document for lipedema provides a strong recommendation for use of pneumatic compression based on grade A evidence.[1]

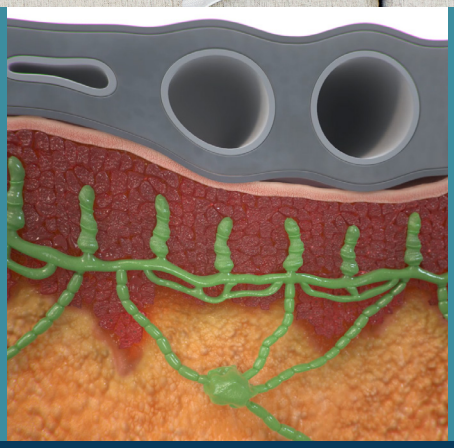
At-home treatment from Tactile Medical.

How Flexitouch® Plus helps lipedema patients.

The Flexitouch Plus system is clinically proven to stimulate the lymphatic system,[25] promoting lymphatic flow for patients from the comfort of their home. It applies light pressure, similar to MLD[26] and is associated with significant reductions in limb swelling,[11, 27] which may help optimize treatment for patients with sensitive limbs.

The Flexitouch Plus system comes with our new ComfortEase garments, which have been redesigned to:

- Be easier to use
- Offer a wider range of sizes for better fit
- Enhance comfort due to thinner, less bulky materials



FLEXITOUCH MECHANISM OF ACTION

The unique mechanism of action of the Flexitouch system stimulates the lymphatics to remove excess fluid and reduce edema.[25] The pneumatic chambers sequentially inflate and deflate for just a few seconds each, creating a gentle wave-like application of pressure to stimulate the movement of lymphatic fluid and direct it toward properly functioning areas of the body.

START SCREENING YOUR PATIENTS FOR LIPEDEMA AND PRESCRIBE FLEXITOUCH PLUS

Let's work together to help your patients suffering from lipedema.

Patient reported outcomes.

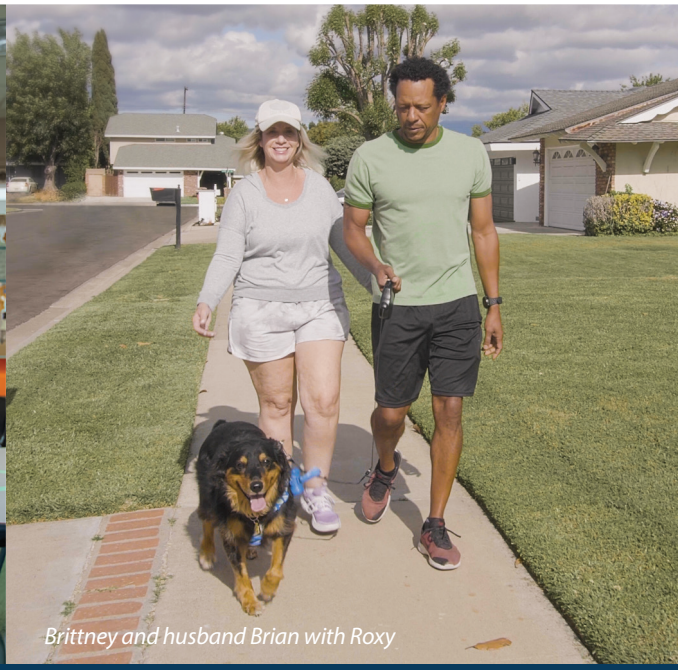
What 143 lipedema patients say about Flexitouch® Plus.

Lipedema patients using the Flexitouch report high levels of satisfaction, compliance and symptom relief accompanied by improvements in daily living. Among the 143 patients surveyed, **91% reported using Flexitouch three or more times per week** and **84% were satisfied or very satisfied** using Flexitouch.

Patients reported these improvements:

↑82%	↓57%	↓47%	↓69%
Improved Symptoms/ Daily Living	Less Heaviness	Less Pain	Reduction in leg swelling

Results after 30 days. Data on file.



Brittney and husband Brian with Roxy

WATCH BRITTNEY'S STORY

"That was a turning point for me. Having Flexitouch allowed me to do my own therapy, in my own home."

– BRITTNEY, KINDERGARTEN TEACHER AND FLEXITOUCH USER

Tactile Medical is a leader in developing and marketing at-home therapy devices that treat chronic swelling conditions such as lymphedema and chronic venous insufficiency.

Let's work together.

Individual results may vary.
Indications/contraindications: Indications, contraindications, warnings, and instructions for use can be found in the product labeling supplied with each device.
Caution: Federal (U.S.) law restricts this device to sale by or on the order of a licensed healthcare practitioner.

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