


# Lymphedema 20/20

## Lymphedema and Lipedema Treatment Updates

Guenter Klose, CLT-LANA  
MLD/CDT Cert. Instructor


**POWER2020**  
LYMPHATICS  
MAR 12-14 | LAS VEGAS | POWERSYMPOSIUM.COM

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## What's ahead

1. Lymphedema Precautions/Risk Reduction Practices.
2. Modern MLD or No MLD; Time to change old practice?
3. Best Practice for Lymphedema.
4. Taking a new Look at Lipedema.
5. All Edemas are NOT Lymphedema!
6. Starling's Law, its Revision and the Glycocalyx;  
A new look at the fluid dynamics on the capillary wall.



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Juzo Power 2020 [klosetraining.com/juzopower2020](http://klosetraining.com/juzopower2020)

**Guenther's Presentation**  Print Friendly  
Lymphedema 20/20: Lymphedema and Lipedema Treatment Updates


**Revised Starling / Glycocalyx**  
Endothelial Glycocalyx and the Revised Starling Principle. E. Crockett. Pulmonary Vascular Research Institute Chronicle, 1(2): 41-46. 2014.  
Like a Slippery Fish, a Little Slime Is a Good Thing: The Glycocalyx Revealed. C. Biddle. AANA Journal, 81(6): 473-480. 2013.  
Microvascular Fluid Exchange and the Revised Starling Principle. J. Levick and C. Michel. Cardiovascular Research, 87: 198-210. 2010.

**KLC 2019: Linda Hodgkins**  
Lymphedema Program Growth Through Standardization: Go Back to the Future  
The Hartford Treatment Model  
Linda Hodgkins MS OTR/L CLT LSP

Ulises Baltazar - Glycocalyx 

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# Lymphedema Precautions




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# Lymphedema Precautions: Time to Abandon Old Practices?

**JOURNAL OF CLINICAL ONCOLOGY** ORIGINAL REPORT

**Impact of Ipsilateral Blood Draws, Injections, Blood Pressure Measurements, and Air Travel on the Risk of Lymphedema for Patients Treated for Breast Cancer**

Chen H, Greene AR, Shih K, Greene SM, Lee H, Chen H, et al. *J Clin Oncol*. 2018;36(23):2503-2510. doi:10.1200/JCO.2017.37.2225

**Purpose:** The goal of this study was to investigate the association between ipsilateral blood draws, injections, blood pressure measurements, and air travel on the risk of lymphedema in breast cancer patients.

**Patients and Methods:** In a retrospective cohort study, we analyzed 1,000 breast cancer patients who underwent ipsilateral blood draws, injections, blood pressure measurements, and air travel. We used multivariate logistic regression to assess the risk of lymphedema associated with these activities.

**Results:** Ipsilateral blood draws, injections, blood pressure measurements, and air travel were associated with an increased risk of lymphedema. The risk of lymphedema was significantly higher in patients who underwent ipsilateral blood draws, injections, blood pressure measurements, and air travel compared with those who did not.

**Conclusion:** Ipsilateral blood draws, injections, blood pressure measurements, and air travel are associated with an increased risk of lymphedema in breast cancer patients. These activities should be avoided when possible to reduce the risk of lymphedema.

**Information downloaded from jco.ascopubs.org and jco.org by guest on September 17, 2019. Copyright © 2019 American Society of Clinical Oncology. All rights reserved.**

**Myths Associated with Lymphedema**

**Arin K. Greene, MD**  
Lymphedema: Presentation, Diagnosis and Treatment  
Springer 2015

**Preventing Lymphedema: Separating Fact From Fiction**

**Babak Mehrara, MD**  
LE&RN Channel  
on YouTube

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# National Lymphedema Network Conference Boston, October 2019

Saturday, October 26, 2019		
7:00	Registration	Grand Ballroom
<b>Pre-conference Sessions</b>		
	Private Practice - The Essentials for Success	Room
	S.T.R.I.D.E.™, Professional Guide to Compression Garment Selection in Clinical Practice	Douglass
	Lymphedema Therapy in the Home Setting	Kathee HOZ
	Head & Neck Lymphedema Management: Be at the Top of Your Practice	John Beckwith
	Advanced Scar Tissue Technique Lab: Enhance Lymph Drainage	Faneuil
	Differential Diagnosis of Vascular Impairments and Associated Edema Management	Carlton
	Wound Care in Nutshell	Burroughs
	Integrating Elastic Taping - A Comprehensive Lab	Lewis
		Burroughs
		Marina I
		Marina II
		Marina III
11:00	medi sponsored welcome reception	Grand Ballroom
<b>General Assembly</b>		
12:45	Welcome	Presenter
1:15	Precautionary Measures for Lymphedema	Jeannette Zucker
1:15	Presenting the Evidence	Jeannette Zucker
1:15	Round Table with Panel of Experts	Alphonse Taghian
1:15	Full Conference Engagement	Alphonse Taghian
3:15	Tactile Sponsored Break in Exhibit Hall	Grand Ballroom
<b>General Assembly</b>		
3:45	Lymphedema Diagnosis & Definition	Presenter
4:00	The Language of Lymphedema	Alexa Enloe
4:00	Multi-Causal Lymphedema	Kathleen Francis
4:20	Universal Agreement on Definition & Diagnosis of Lymphedema	Cheryl Brunelle
4:40	Lymphedema Screening Tool - Full Conference Engagement	Jeannette Zucker
4:55	Q & A	Jeannette Zucker
5:00	Reverent & Exercise for Lymphedema	Jeannette Zucker

Saturday, 1:15  
Precautionary Measures for Lymphedema  
Presenting the Evidence  
Round Table with Panel of Experts

**Jeannette Zucker, DPT**  
**Alphonse Taghian, MD**

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### Painful lymphedema afflicts millions of patients after cancer surgery

By Ranit Mishori  
Special to The Washington Post  
Monday, November 8, 2010, 2:40 PM

It's the aftershock of cancer surgery, a complication that breast cancer survivor \_\_\_\_\_ of Phoenix calls "cancer treatment's dirty little secret," a nasty surprise that sneaks up on you.



### Special garments ease an agonizing ailment for women. But insurance may not pay.

By Carmen Heredia Rodriguez



### Yes, breast cancer survivors, you can lift weights, get manicures and garden

By Susan Berger

July 6, 2019 at 10:30 a.m. MDT

For more than 25 years, many breast cancer survivors were given a lifelong, life-changing warning: Do not lift anything over five pounds, avoid getting manicures, taking saunas or even gardening since it might lead to a painful complication called lymphedema, which can cause irreversible swelling in the arm and often hardening of skin.



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# LYMPHEDEMA PRECAUTIONS

[lymphnet.org/position-papers](http://lymphnet.org/position-papers)

**Position Statement of the National Lymphedema Network**  
By the National Lymphedema Network  
Revised May 2012

**TOPIC: Lymphedema Risk Reduction Practices**

Lymphedema is the accumulation of protein-rich fluid in tissues with inadequate lymphatic drainage. It is not known why some people with the same risk factors develop lymphedema and others do not. An underlying predisposition to developing lymphedema may be a contributing factor. It is scientific evidence is lacking regarding risk reduction practices. It is not known how to reduce the risk of developing lymphedema, or how to minimize its effects.

Many recommendations for risk reduction are common sense approaches based on the body's anatomy and physiology. Because of individual variations in anatomy and because lymphedema may be caused by many different factors, each person with lymphedema or at risk for lymphedema needs to have their risk reduction practices individualized. What works for one person may not work for another.

Based on practical experience, there are some reasonable actions and precautions to be taken for individuals with at risk for lymphedema. Lymphedema is a progressive condition without a cure, caution should be used to avoid to reduce the risk of developing or worsening lymphedema.

This position paper provides information to assist the person with or at risk for lymphedema to make the best possible and most informed choices about risk reduction practices.

If you are not clear about your own risks, meet with a treatment provider who is knowledgeable about lymphedema to discuss your personal strategies for risk reduction.

This paper differentiates people with a confirmed diagnosis of lymphedema from people at risk of lymphedema. People at risk of lymphedema are individuals who have not yet developed the signs and symptoms of lymphedema but have a known insufficiency of their lymphatic system. This includes people who have undergone removal of lymph nodes or radiation therapy, which increases the risk for developing lymphedema. At-risk individuals have altered lymphatic function that may impact the body's ability to take up excess fluids in the tissue.

People with a confirmed diagnosis of lymphedema should consider the following actions and precautions:

- Medical check-ups:** Have regular follow-ups by professionals with training in lymphedema. The follow-up schedule should be based on your individual situation and determined by your lymphedema care provider.
- Reporting changes:** Report to your health care provider any change in your lymphedema, such as increase in size, change in sensation, color, temperature, or skin condition. If your weight or size of lymphedema body part changes, seek assistance from a lymphedema professional to determine if a new course of therapy or new garment is needed.
- Body weight:** Obesity is known to be a major risk factor for lymphedema. A person with lymphedema should maintain a normal body weight and seek professional help to lose weight if your weight is above standard recommended guidelines. In one study, lymphedema treatment was more effective if combined with weight loss. People who do not follow their recommended weight for age and height should seek information from a health care provider.

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Email: info@lymphnet.org • Website: www.lymphnet.org

NLN's Risk Reduction Practices

**Healthy Habits for Patients at Risk for Lymphedema**

**Healthy Lifestyle:** Maintain optimal weight through a healthy diet and exercise to significantly lower risk of lymphedema. Schedule time for the exercise and monitor if any activity or exercise. "Think the Exercise "Pillow" Effect."

**Medical Check-ups:** Have a confirmed lymphedema professional (CLT) check your individual situation, get assessed for lymphedema and discuss risk factors with your CLT. Ask your CLT or healthcare professional if compression garments for the head and neck are indicated for you. If a compression garment is recommended, make sure it is properly fitted and you understand the wear, care, and replacement guidelines. Get a follow-up schedule based on your needs with your CLT. Report any changes in your at-risk body part to your CLT.

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Please Note: These guidelines are meant to help reduce your risk of developing lymphedema and are NOT prevention guidelines. Research shows that the research about the reduction of risk of lymphedema is still limited. Some research on the body's anatomy and knowledge of lymphedema from decades of clinical experience is reported in the text. Risk reduction should always be individualized to a patient's lymphedema history and healthcare professional.

For a full list of the NLN's risk reduction practices, please see our website: [www.lymphnet.org/prevention](http://www.lymphnet.org/prevention)  
To view the NLN's other position papers and find a CLT, go to: [www.lymphnet.org](http://www.lymphnet.org)

NLN's Healthy Habits chart

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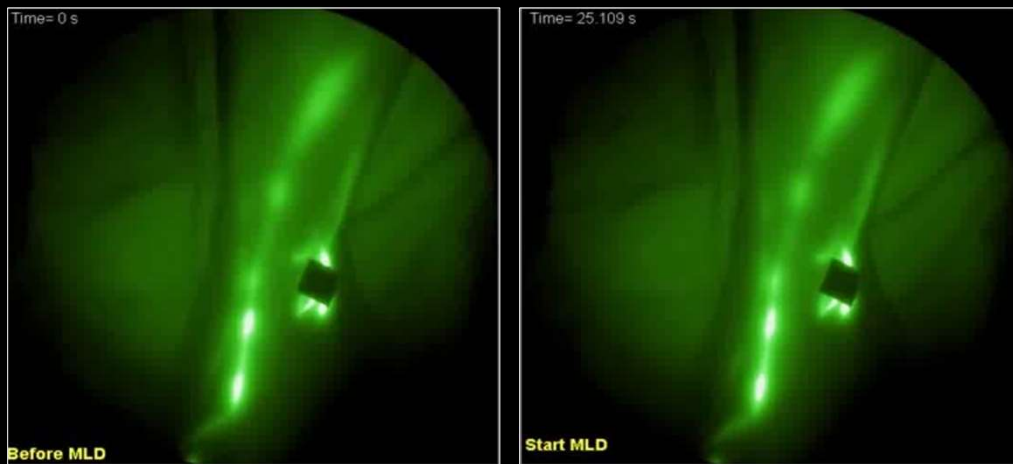


## Modern MLD or No MLD; Time to change old practices?



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## NEAR-INFRARED FLUORESCENCE IMAGING



Before MLD

During MLD

E.M. Sevik-Muraca

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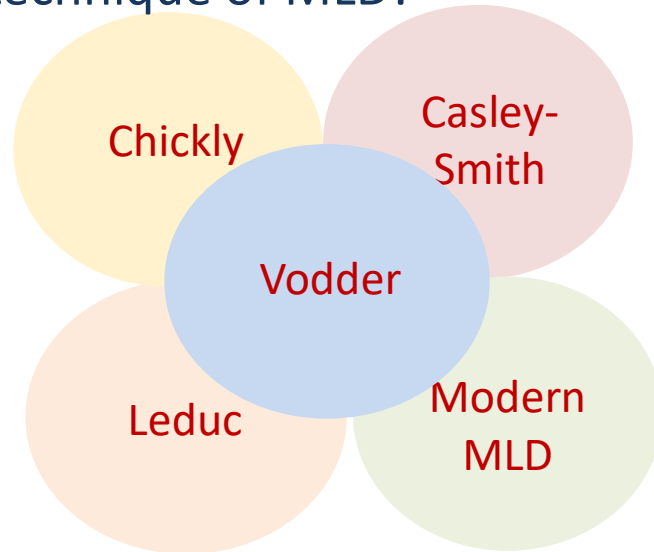


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There is no universal agreement about the correct technique of MLD!



15

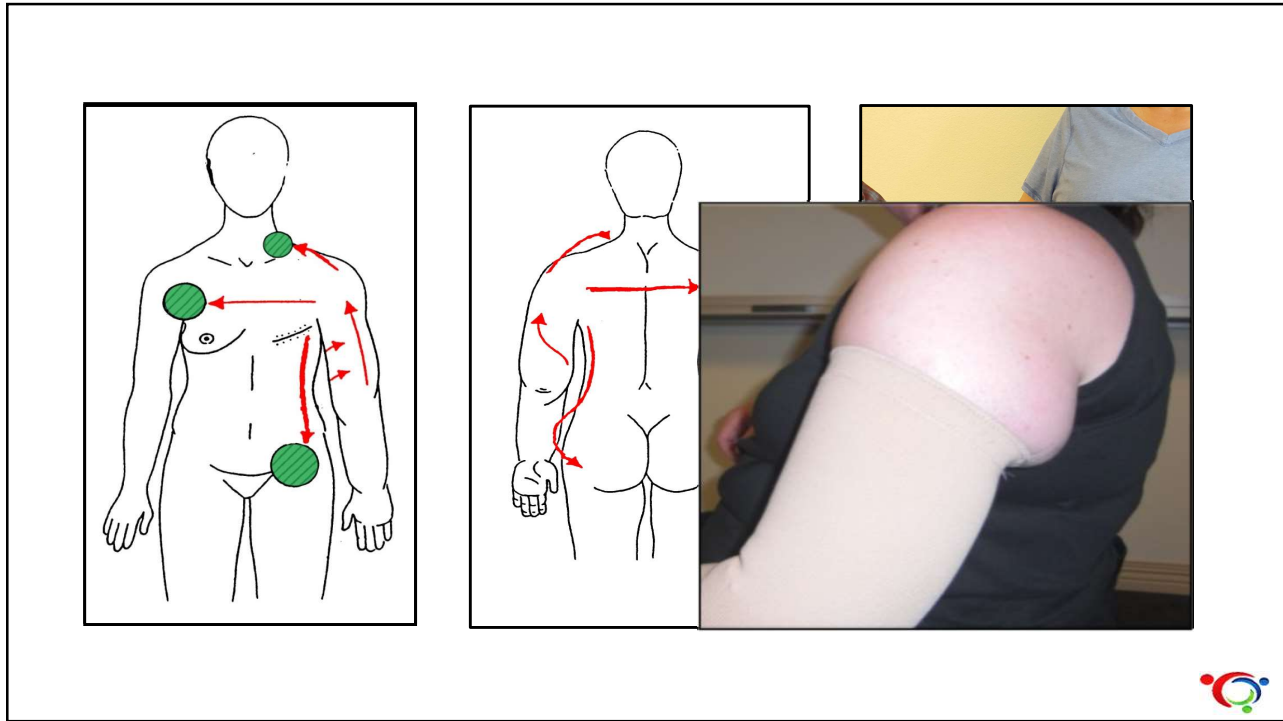
The quality of MLD varies a great deal from one practitioner to the next:



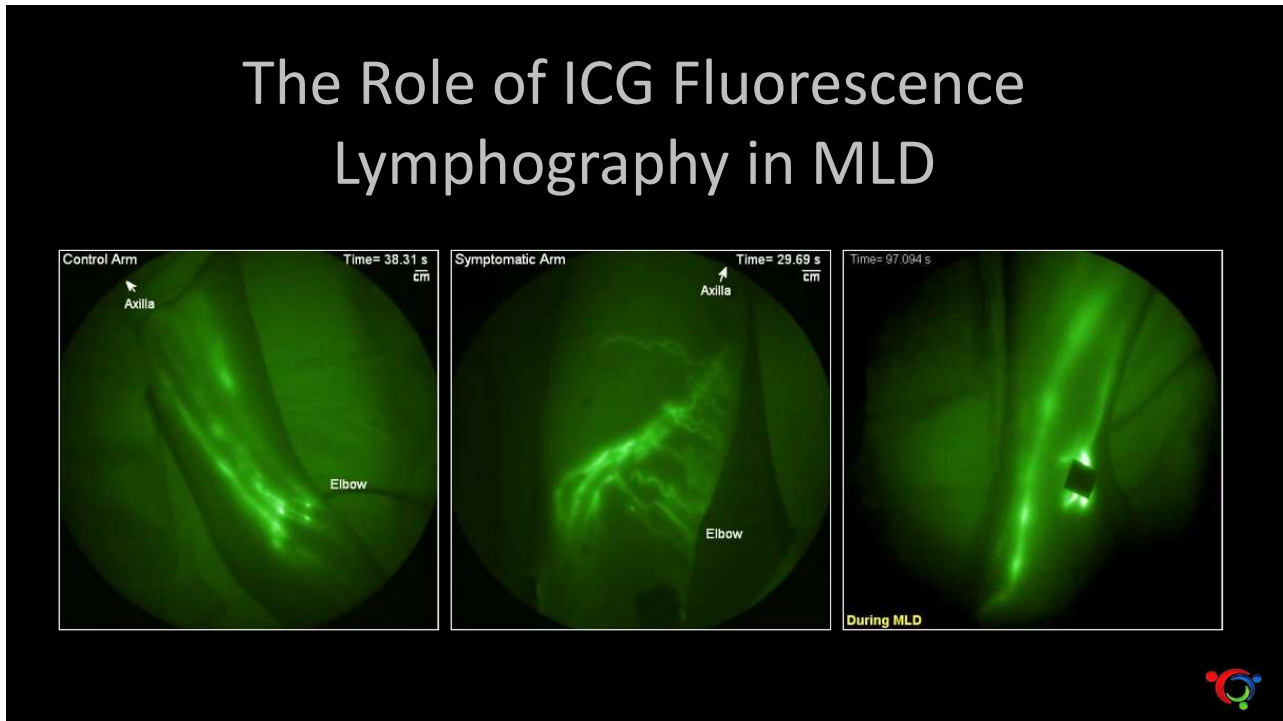
- Training received
- Therapist passion/enthusiasm
- Time constraints
- Reimbursement issues
- Productivity pressure
- Scheduling issues



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TECHNICAL ADVANCE

Open Access

## A new indocyanine green fluorescence lymphography protocol for identification of the lymphatic drainage pathway for patients with breast cancer-related lymphoedema

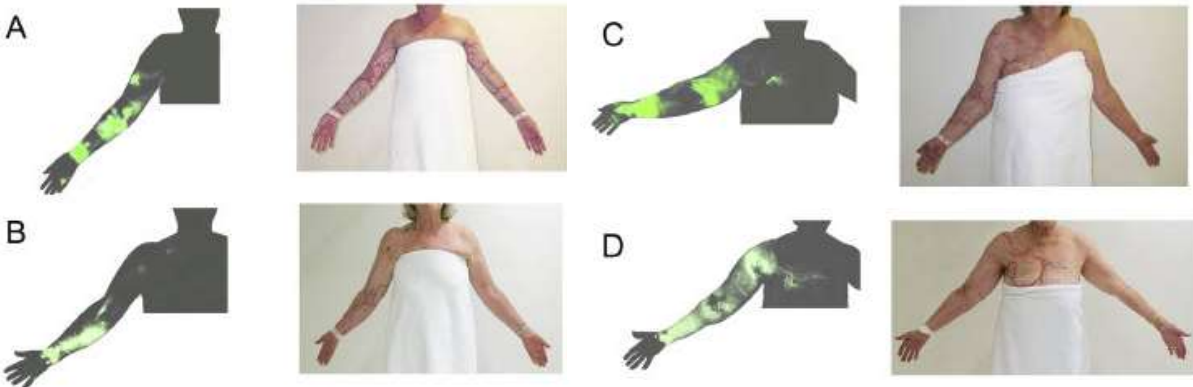
Hiroo Suami<sup>1\*</sup>, Asha Heydon-White<sup>1</sup>, Helen Mackie<sup>1,2</sup>, Sharon Czerniec<sup>1</sup>, Louise Koelmeyer<sup>1</sup> and John Boyages<sup>1</sup>



Comparison of ICG lymphography, tracing photo and lymphoscintigraphy in the same patient



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Patterns of drainage pathways in ICG lymphography images (left) and tracing photos (right): A: ipsilateral axilla, B: clavicular, C: parasternal, and D: contralateral axilla



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## Development of ICG Lymphography Staging

Indocyanine green lymphography staging scale



Stage	0	1	2	3	4	5
Patent lymphatic vessels	++++	+++	++	+	0	0
Dermal backflow	0	+	++	+++	++++ finger/toe	0
Lymphatic vessel contractility	++++	+++	++	+	0	0

Chang DW, Suami H, Skoracki R. *Plast. Reconstructive Surgery*, 2013

Nguyen AT, Suami H, et al. *Journal of Surgical Oncology*, 2016



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The Role of IGL to Guide Therapy - Hiroo Suami, MD - Harvard LE Symposium 2018

### Breast cancer (N=103)

LYMPHATIC DRAINAGE REGIONS

MDA stage	No.	ICG drainage regions				
		Ipsilateral axilla	Clavicular	Parasternal	Contralateral axilla	Ipsilateral Inguinal
1	19	95%	21%	5%	0%	0%
2	46	61%	52%	7%	2%	0%
3	20	70%	55%	5%	5%	0%
4	18	50%	17%	17%	17%	0%
<b>Total</b>	<b>103</b>	<b>67%</b>	<b>41%</b>	<b>8%</b>	<b>5%</b>	<b>0%</b>

❖ Unspecified: 2 cases in stage 4

Hiroo Suami, MD – Harvard Symposium 2018

ALPST - AUSTRALIAN LYMPHOEDEMA EDUCATION, RESEARCH AND TREATMENT

12:12 / 20:16

YouTube

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ICG Fluorescence Lymphography in Guiding Therapy - Hiroo Suami, MD - Harvard Symposium

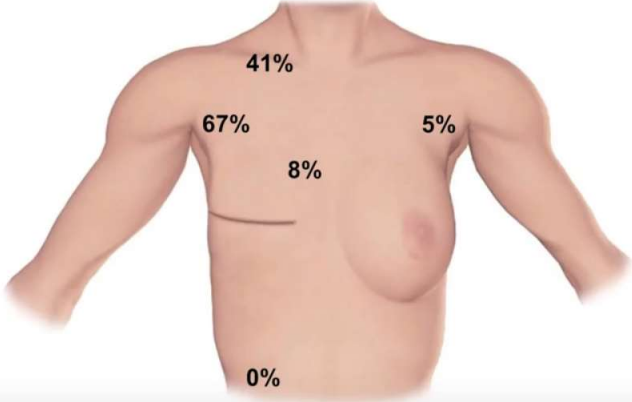
**Breast cancer (N=103)**

LYMPHATIC DRAINAGE REGIONS

**Axillary surgery:**

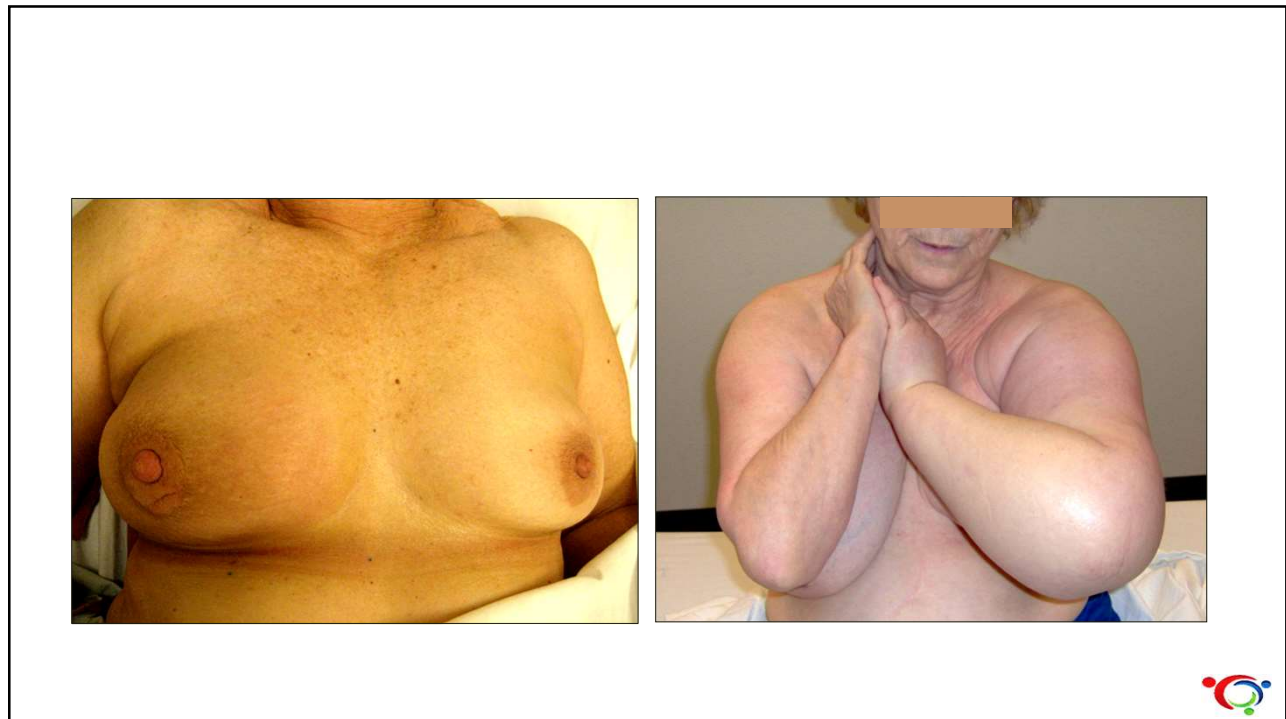
- Axillary dissection: 99
- Sentinel node biopsy: 2
- Unknown: 2

Hiroo Suami, MD  
Harvard Symposium 2018



ALERT - AUSTRALIAN LYMPHOEDEMA EDUCATION, RESEARCH AND TREATMENT | Scroll for details | 11:52 / 20:16 | CC BY-NC-ND

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### Patient with Primary Lymphedema



On intake (1996)



2018



14 yrs. later



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### PATIENT WITH PRIMARY LYMPHEDEMA ON INTAKE (BEFORE CDT)



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## PATIENT WITH PRIMARY LYMPHEDEMA



On intake



4 months later

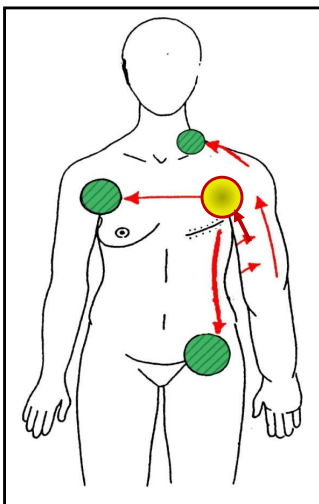


1 year later



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## ICG-guided MLD



Data presented at the 2019 KLC, Denver

- 67% of women after axillary dissection still drain to the ipsilateral axilla.
- In MDA stage 2-4 UE patients with hand edema, the dorsum may drain through the palm.
- MLD may be performed more gently and faster in case of patent lymph vessels/drainage.
- MLD should be performed more firmly and slower in areas of dermal backflow.

Louise Koelmeyer, BAppSc (OT)  
ALA Accredited Practitioner



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**BJC**  
British Journal of Cancer

www.nature.com/bjc

**ARTICLE**  
Clinical Study

Manual lymphatic drainage adds no further volume reduction to Complete Decongestive Therapy on breast cancer-related lymphoedema: a multicentre, randomised, single-blind trial


Mette Tambour<sup>1</sup>, Marianne Holt<sup>2</sup>, Anette Speyer<sup>3</sup>, Robin Christensen<sup>4,5</sup> and Bibi Gram<sup>6</sup>

**BACKGROUND:** We investigated the comparability of Complete Decongestive Therapy (CDT) with or without Manual Lymphatic Drainage (MLD) in the management of arm lymphoedema. **METHODS:** Patients randomised into either treatment in a 2x2 factorial design. The primary outcome was volume reduction after 4 weeks. The secondary outcomes were volume reduction after 7 weeks, heaviness and tension, and health status. **RESULTS:** Despite difficulties enrolling the planned number of patients, 100 patients (50 in each group) completed the trial. In both groups, the volume of the affected arm decreased significantly (1.0% [95% CI, -4.3;2.3%]); the precision in the 95% CI was 1.2% (SE) and -5.7% (SE) at month 7 were -6.8%(1.2) and -5.7%(1.2) respectively. There were no significant differences with respect to any of the secondary outcomes. **CONCLUSION:** Manual lymphatic drainage adds no further volume reduction to CDT. *British Journal of Cancer* (2018) 119:1215–1222; <https://doi.org/10.1038/s41416-018-0000-0>

**INTERNATIONAL CONSENSUS**

**BEST PRACTICE FOR THE MANAGEMENT OF LYMPHOEDEMA**

...there is no doubt that they (MLD & SLD) are of immense value in providing psychological and symptomatic benefits.



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MLD ALONE IS **NOT** THE TREATMENT FOR LYMPHEDEMA!



Patient has been treated with MLD for 10 years



After 3 weeks of CDT (4x/week)



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## Best Practice for Lymphedema: Effective CDT



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There is no cookie cutter approach  
to the treatment of lymphedema!



Stage 1



Stage 2

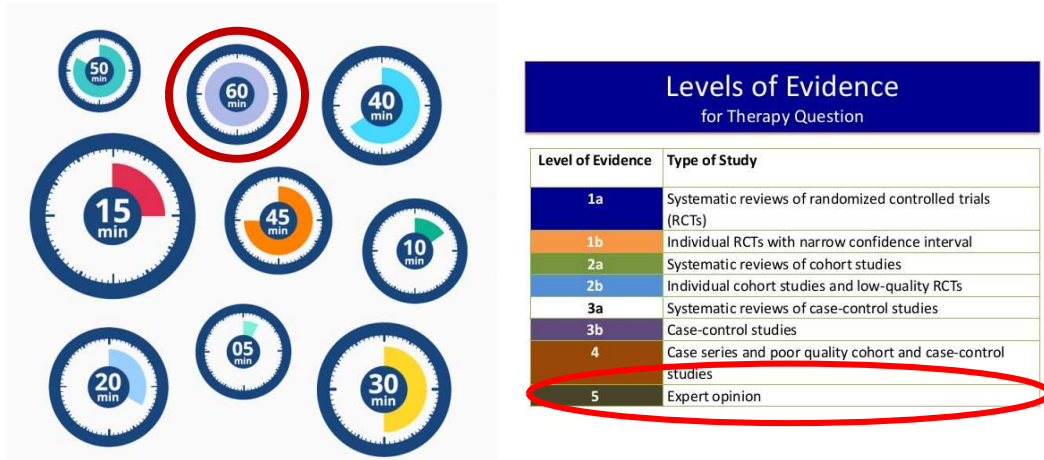


Stage 3



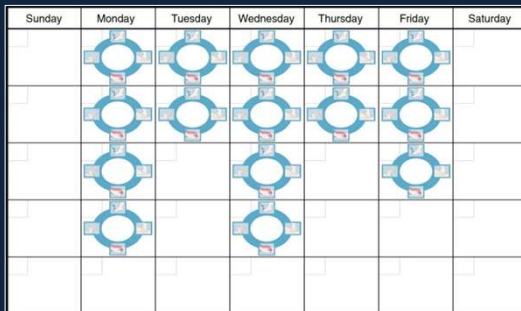
34

# How long does a CDT session need to be to be effective?

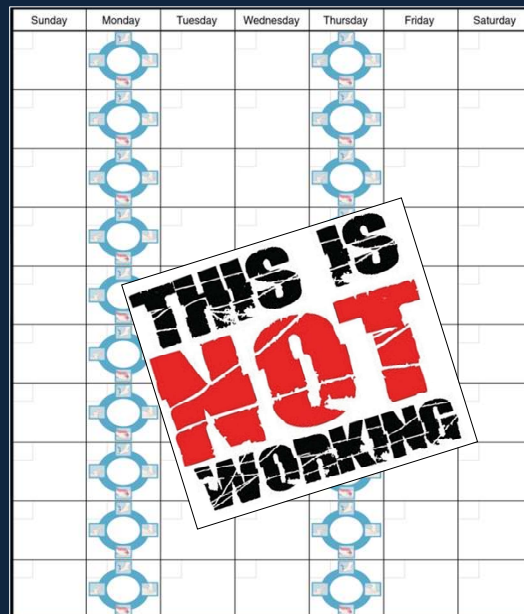


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## Effective CDT Phase 1 Schedule





## Ineffective CDT Phase 1 Schedule



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	Lymphedema Clinic	Hospital
Number of visits per week	5	2
Average total number of visits	13	17
Overall reduction and adherence	+++	+

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Watch Linda's keynote presentation at:  
[klosetraining.com/jobstlecture2020](https://klosetraining.com/jobstlecture2020)



Lymphedema  
 Program Growth  
 through Standardization:  
*Going Back to the Future*

The Hartford Treatment Model  
 Linda Hodgkins MS OTR/L CLT-LANA



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## So, what about:

- My patients don't want to come 5x/week...
- It's not practical for them...
- My Patients don't want to be bandaged...
- My patients can't afford \_\_\_\_\_.



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Patients need to check the credentials  
and experience of their therapist!

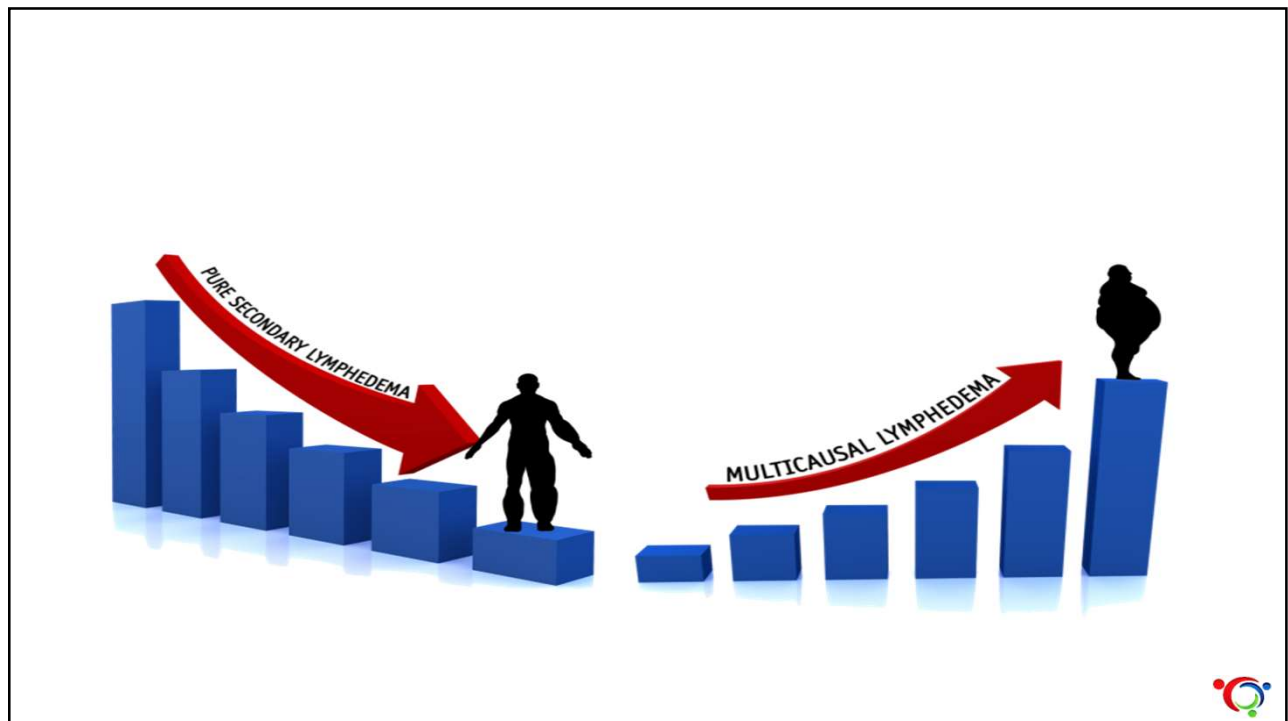
What does their lymphedema program  
consist of?



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## Obesity-Induced Lymphedema



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## Patient after Bariatric Surgery, Before, During and After CDT



See full story: [Living with Lymphedema: Stephanie's Story](#)  
on YouTube & [KloseTraining.com](#)



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## Taking a New Look at Lipedema



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## Classic description of Lipedema



- Symmetrical swelling of both legs
- Affects mainly women
- Hypersensitivity of the increased subcutaneous tissue
- Develops hematoma very easily
- Adipose tissue is resistant to diet and exercise
- Knee pain is a feature of lipedema
- Orthostatic edema
- May turn into lipo-lymphedema
- Onset during puberty, sometimes after pregnancy



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# Stages of Lipedema

Stage I	Skin surface normal, nodular (small) fatty tissue structure	
Stage II	Skin surface uneven (peau d'orange), nodular (big) fatty tissue structure	
Stage III	Lobular deformation due to increase fatty tissue	(Child 2010)



Schmeller



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## Part 5 Available February 2020

**120 Original Article**

### Lipedema – myths and facts Part 2

T. Bertsch<sup>1</sup>, G. Erbacher<sup>1,2</sup>  
<sup>1</sup>Földi Klinik Hinterzarten – Europäisches Zentrum für Lipedemologie, <sup>2</sup>Diät-Physiologie, Psychologische Psychotherapie, Superzentren (Dtl)

**Keywords:** Lipedema, progression, obesity, mental illness, scientific evidence

**Summary:** Lipedema is far more than just fatter and painful legs. As a disorder, lipedema is accompanied with many myths. In the first part of this review, we cast a critical glance at two popular statements about lipedema; statements that found their way into scientific publications decades ago and which have been repeated uncritically and continuously ever since; statements that have since become conventional wisdom for lipedema patients and, in particular, for lipedema self-help groups. In our portrayal of the myths surrounding lipedema, we focus in this article on two aspects in particular that are closely associated with lipedema: obesity and the psychological situation of lipedema patients, which, again, is closely linked to the obesity. We examine two frequently published statements for their scientific evidence: 1. "Lipedema is a progressive disorder", 2. "Lipedema causes mental illness". Both statements largely contradict our many years of daily clinical experience with this specific patient population. At the same time, during our extensive searches of the scientific literature, we also determined that there is no evidence for these claims, which have now become part of the everyday "lipedema language". In fact, lipedema is not usually a progressive

**188 Original Article**

### Lipedema – myths and facts Part 3

T. Bertsch<sup>1</sup>, G. Erbacher<sup>1,2</sup>  
<sup>1</sup>Földi Klinik Hinterzarten – Europäisches Zentrum für Lipedemologie, <sup>2</sup>Diät-Physiologie, Psychologische Psychotherapie, Superzentren (Dtl)

**Keywords:** Lipedema, lipedema, obesity, weight loss, scientific evidence

**Summary:** Lipedema is associated with numerous myths. In this small overview of the myths surrounding lipedema, we throw a critical eye over popular statements regarding the disease. We have found that statements made in scientific publications decades ago have been repeated over and over again without criticism. These statements have become part of the general knowledge for lipedema patients and lipedema self-help groups. In the first part of our presentation we focused on critically reviewing two popular myths about lipedema. We found that there were no scientific evidence for the following statements: "Lipedema is a progressive disease", and "Lipedema negatively affects mental health". In this our second

has no effect on lipedema". For both statements there is neither a reasonable physiological or pathophysiological construct nor is there any scientific evidence in the literature. Furthermore both statements contradict our many years of daily clinical experience with lipedema patients to a high degree. It actually seems that the converse is true: Weight gain seems to be a decisive trigger for the development of lipedema, in patients with the right genetic disposition. Lipedema and obesity are two different diseases, but mostly they appear together. We see patients on almost a daily basis, who effectively lose weight after successful bariatric surgery as part of our obesity program, including in the limbs. Lipedema patients regularly experience considerable improvement in the pain symptoms typical for lipedema through sustained weight loss. These patients are often symptomatic, so that we can then say that the lipedema is in remission. In our fourth contribution to the series we will examine the significance of liposuction for lipedema, in order to then present a therapeutic concept in the last part of the series, that is not only based on scientific evidence, but should also contribute to a long-term and comprehensive

**Original Article**

### Lipedema – Myths and Facts Part 4

#### Lipödem – Mythen und Fakten Teil 4

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Key words  
Lipedema, Liposuction, scientific evidence, obesity

Schlüsselwörter  
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Um das Lipödem anken sich zahlreiche Mythen! In diesem vierten Beitrag unserer Artikelserie setzen wir uns mit dem Stellenwert der Liposuktion beim Lipödem auseinander. Wir dis-

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Phlebologie 2/2018

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## Consensus European Lipedema Forum (2019)

The term Lipedema is misleading and incorrect!

There is **no** scientific evidence that:

- lipedema is an “edema problem”
- MLD is reducing the patients’ complaints due to its drainage effects.
- lipedema is a progressive disease.
- weight loss is not effective.
- lipedema causes lymphedema.
- 11% of the female population suffer from lipedema.
- the onset of Lipedema is during puberty.



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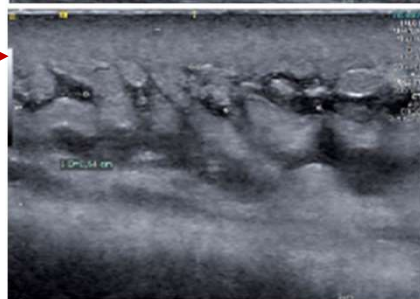
## Lipedema is not an “edema problem”



Patient with lymphedema of the distal lower leg and forefoot and lipedema restricted to the thigh and proximal lower leg



Proximal thigh of the patient with typical ultrasound image of lipedema with unremarkable dermis, thickened subcutaneous tissue, and **no evidence of fluid in the soft tissues**

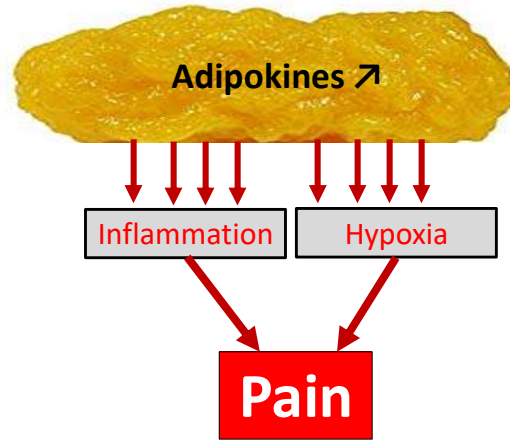


Distal right leg of same patient with typical ultrasound image of **stage 2 lymphedema with partial separation of soft tissues, thickened subcutaneous tissue and fluid in the tissues (small arrows)**



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## Causes of the Lipedema Pain



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### MLD or no MLD?

Reduce edema – No

Improve subjective complaints – Yes

### How about compression therapy?

Reduce edema – No

Decrease inflammation – Yes

Improve microcirculation (hypoxia) – Yes

Decrease subcutaneous pain – Yes

Night compression – No



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### MLD or no MLD?

Reduce edema – No

Improve subjective complaints – Yes

### How about compression therapy?

Reduce edema – No

Decrease inflammation – Yes

Improve microcirculation (hypoxia) – Yes

Decrease subcutaneous pain – Yes

Night compression – No



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“Compression therapy has always been and still is an important element of Best Practice in the treatment of patients with lipedema!”



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### MLD or no MLD?

Reduce lymphedema – Yes

Improve tissue health – Yes

### How about compression therapy?

Reduce lymphedema – Yes

decrease inflammation – Yes

Improve microcirculation (hypoxia) – Yes

Decrease subcutaneous pain – Yes

Night compression – lower leg to knee



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Figure 6. STAGE III LIPEDEMA WITH LARGE DEFORMING FAT DEPOSITS; NOTE SIZE DIFFERENCE BETWEEN UPPER AND LOWER BODY



### How about MLD and Compression?

Reduce lymphedema

Yes, but in the context of a multimodal (multidisciplinary) approach

Night compression



**YES**



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## Obesity and Lipedema

- Being overweight or obese is an aggravating factor of lipedema
- The majority of lipedema patients are obese (80-88%)<sup>REF</sup>
- Majority of patients try “diet and exercise” and experience a yo-yo effect
- Obese patients with lipedema often experience a lack of fitness and mobility
- Obesity/weight gain must addressed



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## Weight loss is effective!



Lipedema patient (122 kg, 168 cm, BMI 43) before sleeve gastrectomy.

Same patient 11 months after bariatric surgery. Weight now 74 kg, BMI 26.



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## Weight loss is effective.



A: Patient with lipedema and predominately distal leg edema.



B: Same patient 1 year later, after a gastric bypass.



C: Excess skin with subcutaneous fat.



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“Lipedema is not usually a progressive disorder! Instead, patients with lipedema experience weight gain (obesity) which can lead to exacerbation of the lipedema.”

“The majority of our (Földi Clinic) lipedema patients are also obese. Very frequently, patients with lipedema experience weight increase that occurs due to regular “dieting” and the subsequent “yo-yo effect”.”



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“With lipedema, the advice to lose weight conventionally is particularly pernicious. **95%** of all people who lose weight with the usual commercial and non-commercial diets regain the weight within 3 years.”<sup>REF</sup>

“Studies at the University of Hohenheim have shown that women (in contrast to men) regain a disproportionate amount of weight in the lower body after weight loss.<sup>REF</sup> In other words: every medical recommendation to a lipedema patient to lose weight increases the risk of exacerbating the lipedema.”



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## Weight Management

- Short term diets must be avoided by all means.
- The concept of energy balance has to be taught.
- Patients must be educated about the pro- and anti-inflammatory effects of their dietary habits and food choices.
- For long-term weight stabilization support and coaching are mandatory.



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## Measures to Reduce Hyperinsulinemia

- Maintain sufficiently long intervals between meals (4-6 hrs. daytime and at least 12 hrs. nighttime).
- Strictly avoid constant “grazing” (especially sweets).
- Avoid foods containing refined carbohydrates or sugar.
- Eat “real food’ instead of processed foods.
- Consume healthy fats and avoid industrial trans-fats.



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## Stabilize and Exercise



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## Bariatric Surgical Approach

- Recommended for patients with lipedema and a BMI of  $\geq 40$
- May be considered for patients with lipedema and a BMI of 35-40

Note: In any case, the bariatric procedure must be part of a multimodal treatment concept.



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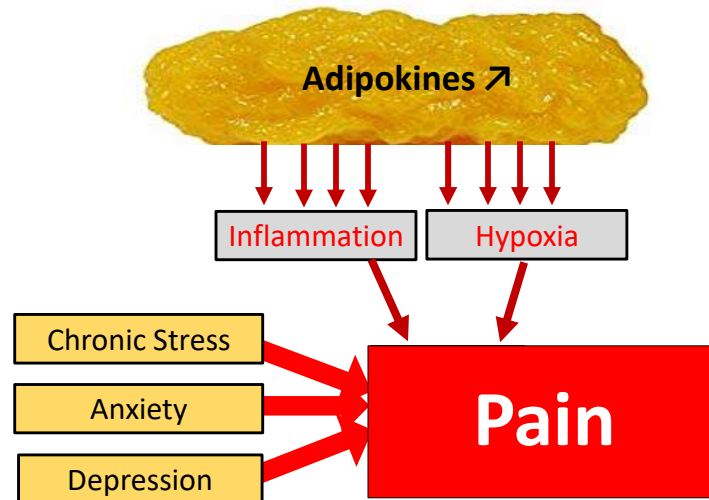
## Psychology in Lipedema

- Psychological issues are an additional aspect of lipedema
- The impact of psychological stress is underestimated!
- Psychological vulnerability contributes to the amount of pain perception
- Eating disorders are often present and need to be treated
- Lack of self-acceptance because of current beauty ideal
- **Conclusion:** Psychological assessment is a must!



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## Causes of the Lipedema Pain



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## Liposuction

Not every patient with lipedema will benefit from liposuction!

Liposuction may be considered if:

- Symptoms persist despite at least 12 month of conservative treatment as presented above
- The patient has considerable functional disability
- The patient's weight has been stable for at least 12 month
- A preoperative psychological assessment is available



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## Self-management The “Math of Motivation”

Motivation is an essential ingredient for changing behavior.

The Motivational Matrix:  
Motivation = importance<sup>1</sup> x self-efficacy<sup>2</sup>

*Any amount of knowledge multiplied by zero motivation will not change a thing!*

<sup>1</sup> Importance of the goal

<sup>2</sup> The belief in one's own ability to achieve the goal



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All edemas are **NOT** lymphedema!



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## WHAT HAS CHANGED?


**Manual Lymphatic Drainage training has dramatically changed over the past few years.** Why? Because lymphatic medicine and research has changed! What we thought to be true in the past is different than what we know now. New ICG Fluoroscopy imaging of live lymphatics and published research in the past few years has begged significant changes in lymphedema educational curriculum:

- \*Starling's Law Debunked!
- \*Endothelial Glycocalyx Layer structure and function explained
- \*New state of the evidence for Modern MLD (finally! the scientific proof we need)
- \*Why all edema is lymphedema, and why it matters
- \*How to improve functional outcomes for TKA and other orthopedic applications
- \*Customize MLD for each individual patient!
- \*Your best route may drain proximal to distal on the extremity. Find out how and why.
- \*Use new research on lymphosomal mapping, and manual assessments, as your guide to customization
- \*Training in the new era of Lymphatic & Integumentary Rehabilitation - why it all comes back to rehab and active movement!

This evidence based, **Modern MLD Certification** course will challenge your mindset and open new doors for more effective results using all your treatment techniques.

# Really?

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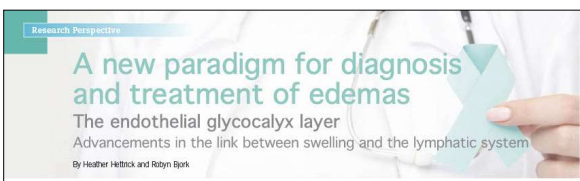
**Not all edemas are lymphedema!**

Patient with CHF edema

Same patient before and after diuretic treatment

Patient with edema from hypoproteinemia

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**A new paradigm for diagnosis and treatment of edemas**  
The endothelial glycocalyx layer  
Advancements in the link between swelling and the lymphatic system  
By Heather Hettrick and Robyn Bjork

**Introduction**  
Although edema can result from a variety of conditions, medications or other contributing factors, it is now understood that all edema is lymphedema through a spectrum of lymphatic insufficiency. This article will highlight the latest evidence supporting this paradigm shift by looking at the new understanding of hemodynamics at the Endothelial Glycocalyx Layer, and the associated links between the lymphatic and integumentary systems. Further, it will explain how this information is relevant to clinical practice to help you differentially diagnose and manage lower extremity edema.

**New lymphedema paradigm**  
One of the most significant recent changes regarding lymphedema is a more refined explanation of fluid hemodynamics impacting our historical understanding of Starling's Law. Previously, it was thought that 90% of fluid moving from the blood to the interstitium was reabsorbed back into the venous end of the capillary, yet the lymphatic system was only responsible for managing 10% of the fluid load. The new paradigm of the Endothelial Glycocalyx Layer (EGL) is the


gatekeeper of fluid filtration from blood capillaries explains how there is only diminishing net fluid filtration across the blood capillary bed and no reabsorption at the venous end; 100% of all interstitial fluid is reabsorbed by the lymphatic capillaries alone during homeostasis<sup>1</sup>. Acting as a complex molecular sieve, the EGL precisely regulates fluid and protein movement through the capillary wall into the tissues<sup>26</sup>. Conversely, the EGL also prevents movement of proteins and fluid back into the venous side of the capillaries, even when interstitial hydrostatic pressure is increased, or tissue oncotic pressures remains higher within the blood capillaries. Thus, all fluid and proteins exiting the blood capillaries must be removed from the interstitium by the lymphatic capillaries alone. This has led to the new understanding that all edemas are on a lymphedema continuum and represent relative lymphatic insufficiency or failure<sup>1,7</sup>. The system is either temporarily overwhelmed (transient lymphedema/dynamic insufficiency) or the system is abnormally developed, damaged or permanently impaired leading to the disease of chronic lymphedema (mechanical lymphatic failure).

**Lymphedema pathophysiology**  
The lymphatic system is analogous to the body's sewer or recycling system. It is responsible for maintaining fluid homeostasis by managing interstitial fluid and removing waste products (proteins, senescent cells, macromolecules, etc.). The lymphatic system is also tasked with the absorption and transportation of lipids and fatty acids to the circulatory system, and transporting antigens, antigen-presenting cells and other immune cells to the lymph nodes where adaptive immunity is stimulated. Collectively, all components within the fluid transported by the lymphatic system are called the "lymphatic load". Pathophysiologically, chronic lymphatic dysfunction or failure prevents venous return affecting the integumentary system. If the lymphatic load is not being reabsorbed by the lymphatic system from the interstitial tissues, a pathological state of chronic inflammation results. Free radicals trapped in the tissues denature proteins and oxidize cell membranes attracting monocytes to the area that differentiate into macrophages. These macrophages take in proteins through phagocytosis, which activates the macrophages to release cytokines. This, in turn, activates fibroblasts, which are stimulated to produce excess collagen<sup>13</sup>. Excess collagen formation causes connective tissue proliferation and fibrosis resulting in the thickened, fibrotic skin and white projections (papillomatosis and verrucous) commonly seen with chronic lymphedema<sup>1</sup>. Additionally, other fibroblasts differentiate into adipocytes<sup>1</sup>. If treatment is not implemented, the chronic inflammatory process persists and the clinical presentation eventually can result in enlargement of the body part, thickened and fibrotic dermal and subcutaneous tissues, and other significant integumentary changes<sup>1</sup>.


within the blood capillaries. Thus, all fluid and proteins exiting the blood capillaries must be removed from the interstitium by the lymphatic capillaries alone. **This has led to the new understanding that all edemas are on a lymphedema continuum** and represent relative lymphatic insufficiency or failure<sup>1,7</sup>. The system is either temporarily overwhelmed (transient lymphedema/dynamic insufficiency) or the system is abnormally developed, damaged or permanently impaired leading to the disease of chronic lymphedema (mechanical lymphatic failure).

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**The Lymphedema Chaos: A Lancet**  
Etel Földi, M.D.\*  
Michael Földi, M.D.\*  
Leo Clodius, M.D.†

*Pathophysiology of lymphedema is not an enigma. It is caused by a low-output failure of the lymph vascular system in combination with an inadequate scavenging of stagnating plasma protein by macrophages. Axillary venous diseases alone never cause chronic postmastectomy edema. In the diagnosis of lymphedema, invasive methods (i.e., direct lymphography and venography) are not only unnecessary but are potentially harmful and do not give any information of therapeutic relevance. Lymphedema of the limbs without reflux of lymph or chyle is not a surgical disease. It can be treated successfully by the skillful application of specific physiotherapeutic measures free of any side effect. The results of this therapy can be maintained if the patient's compliance is good.*

Földi E, Földi M, Clodius L: The lymphedema chaos: a lancet. Ann Plast Surg 22: 455, 1989

**1989**

**All edemas are on the lymphatic continuum!**


In this article we discuss some recently published conflicting opinions concerning the pathophysiology and therapy of lymphedema and present a plea for the conservative treatment of this "perplexing and poorly understood clinical entity" [21].

**Physiology and Pathophysiology of the Lymph Vascular System**

To understand lymphedema, the concept of the insufficiency of the lymph vascular system [13] has to be defined. The lymph vascular system is insufficient if its transport capacity is lower than the lymphatic load. The expression "transport capacity" is defined by the highest possible lymph flow per unit of time. We have proposed to distinguish three forms of lymph vascular insufficiency. Not conceiving or misunderstanding these three forms is a prime source of lymphedema chaos.

One form of lymph vascular insufficiency is called dynamic insufficiency. It arises if the lymphatic load exceeds the lymphatic transport capacity. In this case, the lymphatics are anatomically and functionally normal but overwhelmed. The main propulsive force of the lymph is generated by the contractions of the lymphangions (segments of lymphatics bordered by a

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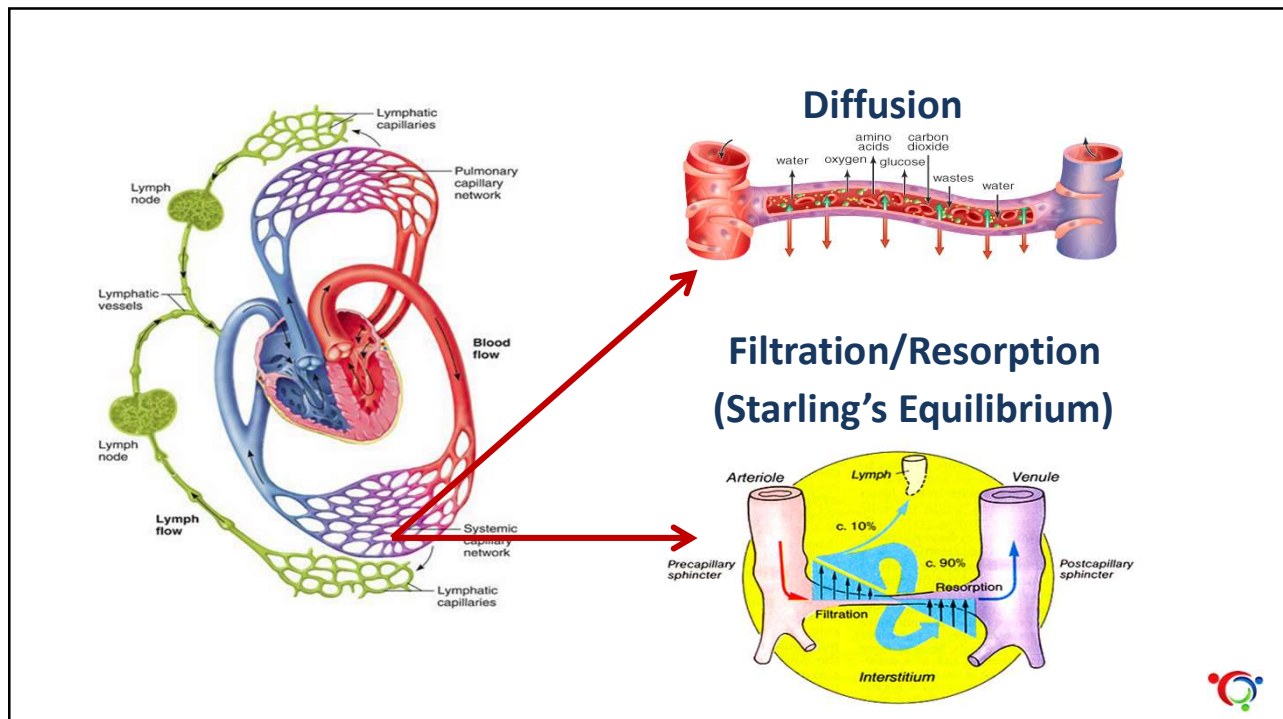
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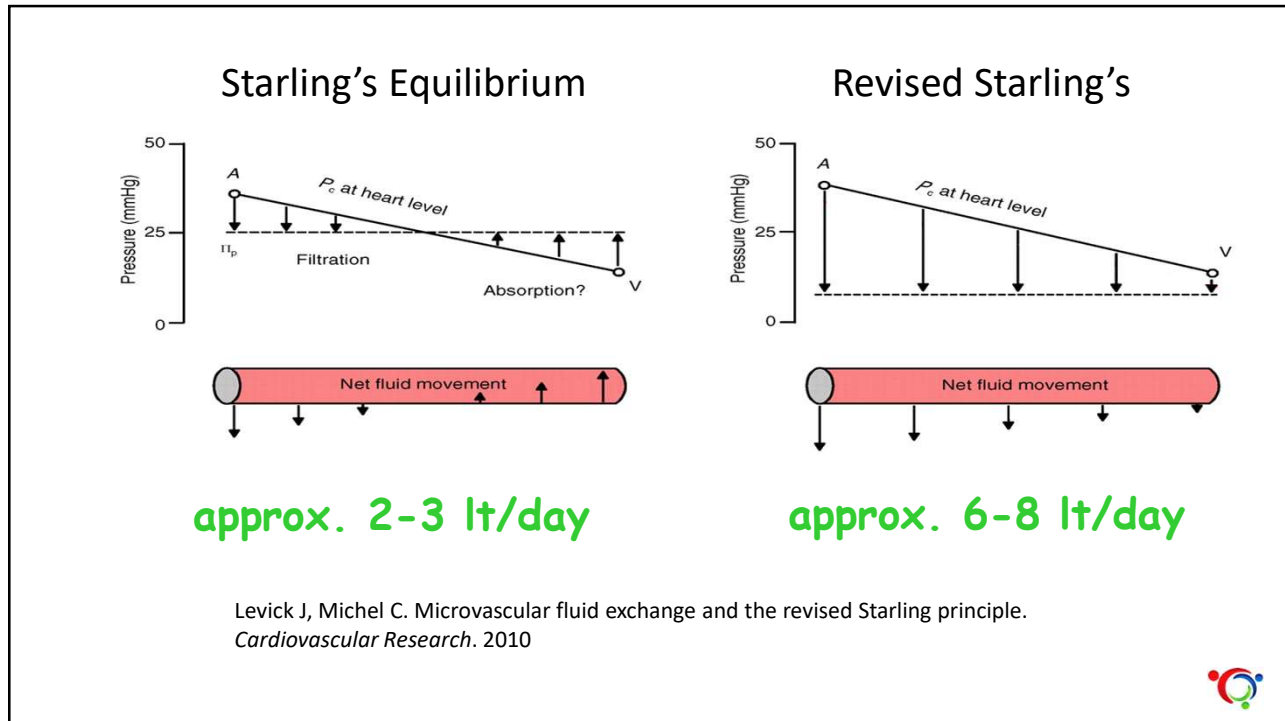
## Starling's Law, its Revision and the Glycocalyx; A new look at the fluid dynamics on the capillary wall.



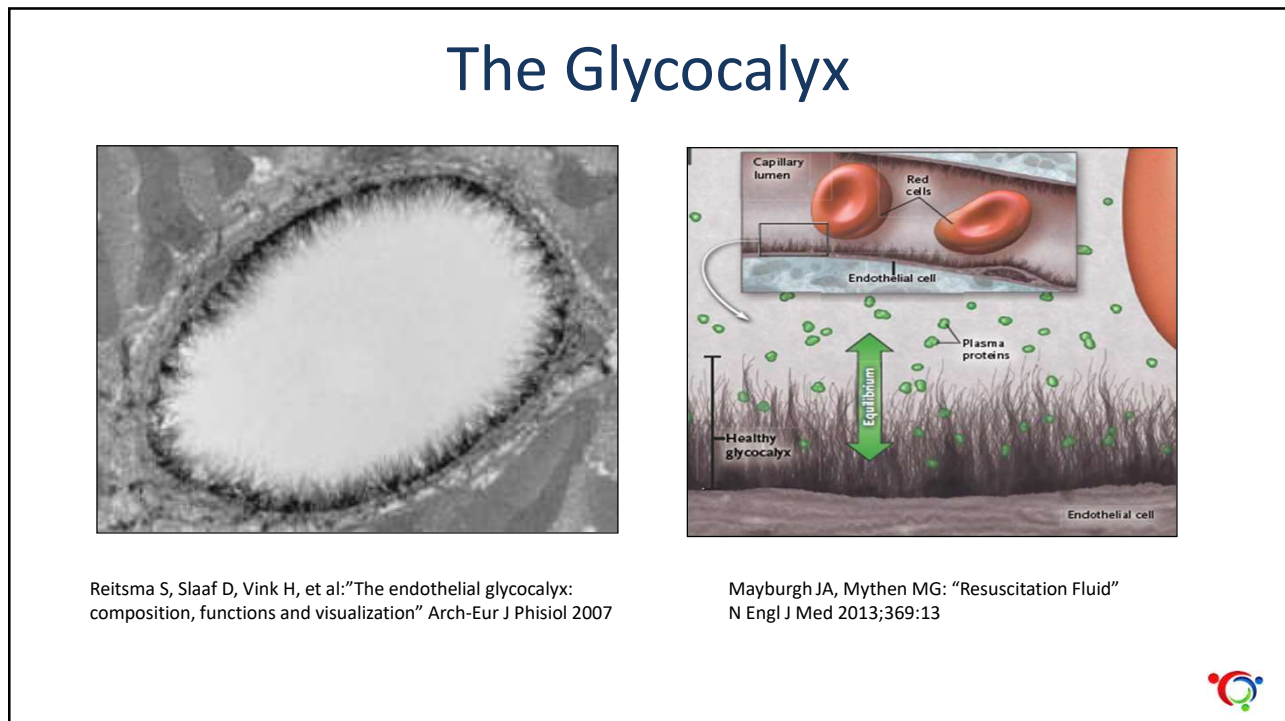
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The Glycocalyx

Total surface 4000-7000m<sup>2</sup> (0.98-1.7 acres)

Negative net charge

**Ulises Baltazar**  
MD, FACS, CLT

Watch Dr. Baltazar's presentation at:  
[klosetraining.com/jobstlecture2020](http://klosetraining.com/jobstlecture2020)

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