

10TH INTERNATIONAL LYMPHOEDEMA FRAMEWORK CONFERENCE

DANISH WOUND HEALING SOCIETY ANNUAL MEETING

18-20 NOVEMBER 2021
COPENHAGEN · DENMARK

WWW.2021ILFCONFERENCE.ORG
#ILFLYMPHO2021

JOINT CONFERENCE WITH THE DANISH LYMPHOEDEMA
FRAMEWORK & THE DANISH WOUND HEALING SOCIETY



DANISH WOUND
HEALING SOCIETY



Dansk Netværk for Lymfødem
Danish Lymphoedema Framework



INTERNATIONAL
LYMPHOEDEMA
FRAMEWORK

IN-PERSON & ONLINE



INTERNATIONAL
LYMPHOEDEMA
FRAMEWORK

INTERNATIONAL LYMPHOEDEMA FRAMEWORK

WHO WE ARE

A UK-based charity founded in 2009 with 15 national frameworks across the world.

Board of Directors with 10 international members.

Extensive activities such as conferences, international research and data collection, active communication and communitybuilding through our website, social media, webinars and regular newsletters.

WHAT WE BELIEVE

Patients should always be at the heart of all projects.

Only a collaborative and multidisciplinary partnership between all stakeholders can lead to an improvement in the management of lymphoedema.

Improving the management of lymphoedema is a dynamic process that requires ongoing research and implementation into practice.

International collaboration is essential.

WE CURRENTLY WORK ON

Genital oedema – to understand the educational needs of both patients and professionals.

Children with lymphoedema – to develop a “Quality of Life” tool for children and young people.

Chronic oedema outcomes – to develop global chronic oedema outcome measures for the treatment of lymphoedema.

LIMPRINT & Child LIMPRINT studies – to capture the scale and impact of chronic oedema.

SIGN UP!

Sign up today for free and become an ILF Affiliate! We'll keep you informed about our goals and

activities, and the work of national frameworks across the world.

As an ILF Affiliate, you will receive several benefits:

- Reduced fee at future conferences
- Regular updates on activities and resources
- Opportunities to network with national lymphoedema frameworks
- Opportunities to influence future activities and direction.



Scan and sign up here

FOLLOW US!



IntLymphFramework



ILF_Lympho



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ilflympho

Free online resources, publications, films, webinars on-demand and much more available at www.lympho.org

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Dear conference delegate,

It is with great pleasure that we are finally able to welcome you to the 10th International Lymphoedema Framework Conference, ILF 2021, in collaboration with the Danish Wound Healing Society (DSFS) and the Danish Lymphoedema Framework (DNL/DLF).

The uninvited guest COVID-19 not only changed daily life for many people all over the world – it also influenced the planning of our conference and forced us to reschedule more than once. Therefore, it is with great enthusiasm that we are now able to introduce to you the ILF 2021 as a HYBRID conference. A “hybrid conference” is one of many new interventions caused by COVID-19, and we are excited to present a programme with both live and online presentations and participants – allowing people living in countries with travel restrictions as well as in low-resource countries to be included in this truly international event.

We are extremely pleased that so many of you have had the patience to wait for this conference. We trust that the programme prepared for you with scientific presentations, patient-dedicated sessions on the Saturday Patient Day, as well as the large industry exhibition will offer you plenty of activities and new learnings over the next days.

For COVID-19 information please consult the “General Information” section in this programme book. If you experience any COVID-19 symptoms, then please do not enter the conference venue but contact the conference secretariat for guidance. Please sanitise hands frequently and take good care of each other!

Enjoy the conference and please do not forget to find some time to also enjoy the city of Copenhagen. Welcome to the ILF and DSFS 2021 conference!

Christine Moffatt CBE
Chair of the International
Lymphoedema Framework (ILF)

Susan Bermark
Chair of the Danish Wound
Healing Society (DSFS)

Tonny Karlsmark
Chair of the Danish Lymphoedema
Framework (DNL/DLF) and chair of
the ILF 2021 Scientific Committee

Årsmøde 2022

afholdes

torsdag den 24. – fredag den 25. november 2022
på Comwell Hotel i Kolding.

Reserver dagene nu! Program og tilmelding findes på vores hjemmeside www.saar.dk fra midt i september 2022.

TEMADAG "Rundt om smerter og sår"

afholdes

fredag den 18. marts 2022 kl. 8.30-16

i Ringsted Kongrescenter

Reserver dagen nu! Program og tilmelding findes på vores hjemmeside www.saar.dk fra midt i januar 2022. Har du forslag til programpunkter, så giv os gerne et tip.



DANSK SELSKAB FOR SÅRHELING

post@saar.dk – telefon +45 30354880 (mandag og onsdag kl. 16-18)

LOCAL ORGANISING COMMITTEE

Tonny Karlsmark

Chair of the Danish Lymphoedema Framework (DNL/DLF), representing the Danish Knowledge Centre for Lymphoedema at Bispebjerg Hospital, Copenhagen, and Member of the ILF board of directors

Susan Bermark

Chair of the Danish Wound Healing Society (DWHS)

Kirsten Hedeager

Danish Lymphoedema Framework (DNL/DLF) steering committee member, representing the Danish Society of Lymph Therapists

Pernille Henriksen

Danish Lymphoedema Framework (DNL/DLF) steering committee member, representing the patient association DALYFO

Susan Nørregaard

Danish Lymphoedema Framework (DNL/DLF) steering committee member, representing the Danish Knowledge Centre for Lymphoedema at Bispebjerg Hospital, Copenhagen, and Member of the ILF board of directors

Helle Madsen

Danish Wound Healing Society (DWHS) daily manager

Dorthe Mogensen

Danish Wound Healing Society (DWHS) chair of the education committee

SCIENTIFIC COMMITTEE

Tonny Karlsmark (Denmark)

Chair of the Danish Lymphoedema Framework (DNL/DLF), representing the Danish Knowledge Centre for Lymphoedema at Bispebjerg Hospital, Copenhagen, and Member of the ILF board of directors

Susan Bermark (Denmark)

Chair of the Danish Wound Healing Society (DWHS)

Annette Høgh (Denmark)

Danish Wound Healing Society (DWHS) board treasurer

Christine Moffatt CBE (United Kingdom)

Chair of the ILF board of directors

Susan Nørregaard (Denmark)

Danish Lymphoedema Framework (DNL/DLF) steering committee member, representing the Danish Knowledge Centre for Lymphoedema at Bispebjerg Hospital, Copenhagen, and Member of the ILF board of directors

Isabelle Quéré (France)

Member of the ILF board of directors

Melanie Thomas MBE (Wales, United Kingdom)

Member of the ILF board of directors

Merete Wittenkamp (Denmark)

Danish Lymphoedema Framework (DNL/DLF) steering committee member, chair of the Danish Society of Lymph Therapists

ABOUT ILF

ILF was established as a UK charity in 2009. The framework developed from a project aiming at bringing together the main stakeholders involved in the management of lymphoedema in the United Kingdom in 2002, but ILF rapidly spread to become an international project with an objective to support individual countries develop a long-term strategy for lymphoedema management.

For more information about ILF, please visit:

www.lympho.org

ABOUT DNL/DLF

The Danish Lymphoedema Framework (DNL/DLF) was established in 2010 and is an active partner of the International Lymphoedema Framework (ILF). DNL/DLF is recognised as a professional interdisciplinary network of doctors, nurses, physiotherapists, and other therapists as well as patients and industry partners. DNL/DLF works across personal and professional interests to raise awareness and spread knowledge about lymphoedema and for cost-free treatment of lymphoedema in Denmark. The DNL/DLF steering committee integrates representatives of the Danish Knowledge Centre for Lymphoedema (Bispebjerg Hospital, Copenhagen) as well as the Danish Society of Lymph Therapists and the patient association Danish Lymphoedema Association (DALYFO).

For more information about DNL/DLF, please visit:

www.dnl-dlf.dk

ABOUT DWHS

The Danish Wound Healing Society (DSFS) was established in 1992 as the first wound care society in Scandinavia. It has about 1,000 members, mainly nurses, doctors and therapists in health care. Amongst other DSFS strives to increase the knowledge about wound care and to establish wound care as a separate discipline or expert area in the Danish health care system.

For more information about DSFS, please visit:

www.saar.dk

GENERAL INFORMATION

CONFERENCE LANGUAGE

The conference will be held in a combination of Danish and English. The ILF coordinated sessions will all be in English whereas the DWHS coordinated sessions will be in Danish except for one international guest session which will be conducted in English.

CONFERENCE SECRETARIAT



Nordre Fasanvej 113
2000 Frederiksberg C
Denmark
Tel: 0045 70 20 03 05
www.cap-partner.eu

CONFERENCE VENUE

The Hangar at Comfort Hotel
Copenhagen Airport
Ellehammersvej
2770 Kastrup
Denmark

CONFERENCE WEBSITE

www.2021ilfconference.org

COVID-19

Currently, there are no COVID-19 restrictions in place in Denmark. However, all conference participants are encouraged to make frequent use of the widely available hand sanitizer dispensers at the venue.

Use of face masks is optional, but not mandatory anywhere in Denmark. If you prefer to wear a mask during the conference this is possible and fully accepted. Should you experience any COVID-19 symptoms then please do not enter the conference venue. In this case, please contact the conference secretariat and you will receive guidance about where to get tested and how to react. Find useful information at www.en.coronasmitte.dk

CLOAK ROOM

The cloak room is located in the foyer and will be available during the scheduled programme.

CME CREDITS & CERTIFICATE OF ATTENDANCE

The conference has been accredited with 16 European CME credits (ECMEC) by the European Accreditation Council for Continuing Medical Education (EACCME). CME certificate and certificate of attendance can be downloaded after the conference. You will receive an e-mail with more information and the link to download the certificates after the conference.

LOST AND FOUND

Found items should be returned to the registration desk. If you lose something, please report to this desk for assistance.

LUNCH AND REFRESHMENTS BREAKS

Lunch and refreshments during breaks are served in the exhibition area. See programme for exact time of breaks.

MOBILE PHONES

All mobile phones must be on silent mode during the sessions.

NAME BADGES

The conference name badges must always be worn during the conference. Access to the conference venue will not be granted without the name badge issued by the conference organisers.

POSTER SESSION

The poster area is located at Hangar 3.

SPEAKER INFORMATION

Please bring your presentation on a USB stick to the Speakers' Preview Room at the venue. An assistant will help you upload the presentation to the computer.

Please make sure to upload your presentation at least 30 minutes before your session starts.

Use of personal laptops for presentation is not allowed. At the end of the conference, all presentations will be deleted to secure that no copyright issues will arise.

SPEAKER'S PREVIEW ROOM

Located in Hangar 3.

The opening hours are:

Thursday, 18 November	7:30 - 17:00
Friday, 19 November	7:30 - 17:00
Saturday, 20 November	9:00 - 14:00

WIFI

Free WIFI is provided.

Name of network is Comfort.

No password is needed.

SOCIAL PROGRAMME

CONFERENCE DINNER

Date Thursday, 18 November 2021
Time 19:00 – 01:00
Place The Hangar at Comfort Hotel Copenhagen Airport

A welcome drink will be served at the Hangar Foyer and the dinner takes place in Hangar 4+5. The dinner includes 3 courses and 2 drink vouchers. After the dinner there will be dancing to the music of Lars "Pap" Allstars.

NB: The dinner is not included in the registration fee.

ILF RUN & YOGA AROUND THE GLOBE

Everyone knows how important exercise is in the treatment of Lymphoedema and Lipoedema and how great it is to move together in a fantastic environment! Medi will organise a sportive walk/run and yoga class to promote exercise.

Date Saturday, 20 November 2021
Time 07:30 – 08:30

Meeting point RUN

07:15 in the hotel lobby at the Comfort Hotel Copenhagen Airport

Meeting point YOGA

07:15 Room 'Charlie' on 1st floor of the Comfort Hotel Copenhagen Airport

For the run there will be two routes to choose from: 2 or 5 km routes for all participants. Running, walking, or both!

Medi will sponsor a free shirt and stockings to each participant. The shirts and stockings can be picked up at the medi booth (no. 18) during the first days of the conference.

The registration fee is 10 EUR with all the money going towards benefiting delegates from developing countries attending future ILF conferences. Don't hesitate and join. It is not about who is the fastest or best, but who is willing to participate!

Tickets can be bought through the online registration or at the registration desk in the foyer.

Fee for participation:
2 km – € 10
5 km – € 10
Yoga – € 10

PROGRAMME OVERVIEW

THURSDAY 18 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
08:30 - 10:00	OPENING: Welcome by ILF/DSFS/DLF: Christine Moffatt, Susan Bermark and Tonny Karlsmark				
	PLENARY I: Wounds & Chronic oedema (Joint session of ILF & DSFS)	Chairs: Christine Moffatt & Susan Bermark			
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
10:30 - 12:00	PLENARY II: Wounds with lymphoedema (Joint session of ILF & DWHS)	Chairs: Tonny Karlsmark & Annette Høgh			
12:00 - 13:30 Lunch, exhibition & poster viewing					
12:20 - 13:20	Industry sponsored symposium A		12:20 - 13:20	Industry sponsored symposium B	
13:30 - 15:00	Plenary III: Assessment and Diagnostics	Chair: Sandro Michellini	13:30 - 14:10	Workshop (pre-recorded): Ultrasonography for prediction of cellulitis in lymphoedema. Live Q & A.	Misako Dai & Junko Sugama*
			14:15 - 15:00	Challenges and collaboration	Chair: Tonny Karlsmark
15:00 - 15:30 Refreshment break, exhibition & poster viewing					
15:30 - 17:00	Cancer-related lymphoedema	Chair: Merete Wittenkamp	15:30 - 17:00	Lipoedema management I	Chair: Christoffer Nissen
19:00 - 01:00 Conference dinner at Hangar 4+5					

Meeting room 'Charlie', 1st floor		Hangar 1 (DSFS)	
		08:30 - 10:00	Joint session with ILF
10:00 - 10:30 Refreshment break, exhibition & poster viewing			
		10:30 - 12:00	Joint session with ILF
12:00 - 13:30 Lunch, exhibition & poster viewing			
		13:30 - 15:00	Kræftsår og andre specifikke sår (In Danish) Chair: Rikke Trangbæk
15:00 - 15:30 Refreshment break, exhibition & poster viewing			
15:30 - 17:00	Free paper session 1 (7x7 min.+3 min.) Chair: Pinar Borman	15:30 - 17:00	Diabetiske fodsår (In Danish) Chair: Jonas Askø Andersen
		17:00 - 18:00	Generalforsamling i Dansk Selskab for Sårheling (In Danish and members only)
19:00 - 01:00 Conference dinner at Hangar 4+5			

PROGRAMME OVERVIEW

FRIDAY 19 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
07:30 - 08:15	Industry sponsored symposium C		08:30 - 10:00	Free paper session 3 (7x7 min. + 3 min.)	Chair: Tonny Karlsmark
08:30 - 10:00	Approaches to managing genital oedema	Chair: Melanie Thomas			
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
10:30 - 12:00	PLENARY IV: Dilemmas on compression	Chairs: Christine Moffatt & Isabelle Quéré	10:30 - 12:00	Free paper session 4 (7x7 min. + 3 min.)	Chair: Jean-Paul Belgrado
12:00 - 13:30 Lunch, exhibition & poster viewing					
12:20 - 13:20	Industry sponsored symposium D		12:20 - 13:20	Industry sponsored symposium E	
13:30 - 15:00	Children with lymphoedema	Chair: Christine Moffatt	13:30 - 15:00	Free paper session 5 (7x7 min. + 3 min.)	Chair: Wouter Hoelen
15:00 - 16:15 Refreshment break, exhibition & poster viewing					
15:15 - 16:15	Industry sponsored symposium F		15:15 - 16:15	Industry sponsored symposium G	
16:15 - 17:45	Outcome Measures	Chairs: Christine Moffatt & Susan Nørregaard	16:15 - 17:45	Free paper session 6 (7x7 min. + 3 min.)	Chair: David Keast

Meeting room 'Charlie', 1st floor			Hangar 1 (DSFS)		
08:30 - 10:00	Free paper session 2 (7x7 min.+3 min.)	Chair: Marina Cestari	08:30 - 10:00	Dermatologi (In Danish)	Chair: Ewa Burian
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
			10:30 - 12:00	Tryksår / Pressure Ulcers (In English)	Chair: Åse Fremmelev-holm
			11:40 - 12:00	Legatuddeling (In Danish)	Susan Bermark
12:00 - 13:30 Lunch, exhibition & poster viewing					
			13:30 - 15:00	Hudtransplantation (In Danish)	Chair: Bo Jørgensen
15:00 - 16:15 Refreshment break, exhibition & poster viewing					
			16:15 - 17:45	Kompression/Ødem (In Danish)	Chair: Dorthe Mogensen

PROGRAMME OVERVIEW

SATURDAY 20 NOVEMBER 2021

	Hangar 5 - Streaming			Hangar 2 - Streaming	
	07:30 CHARITY RUN & YOGA AROUND THE GLOBE				
09:30 - 10:30	Indocyanine green (ICG) fluoroscopy	Chair: Isabelle Quéré	09:30 - 10:30	Patient Session 1	Chair: Tonny Karlsmark
10:30 - 11:15	Industry Workshop A		10:30 - 11:15	Industry Workshop B	
	11:15 - 11:45 Refreshment break, exhibition & poster viewing				
11:45 - 12:45	Self-managed challenges	Chair: Meadhb McSweeney	11:45 - 12:45	Meet an Expert: Ask your questions and get an answer	Chair: Susan Nørregaard
	12:45 - 13:45 Lunch, exhibition & poster viewing				
13:45 - 15:15	Lipoedema Management II	Jørgen Rungby	13:45 - 15:15	Patient Session 2	Chairs: Pernille Henriksen & Susan Nørregaard
	15:15 - 15:45 Refreshment break, exhibition & poster viewing				
15:45 - 16:15	Closing		15:45 - 16:15	Closing	

	Meeting room 'Charlie', 1st floor	
	07:30 CHARITY RUN & YOGA AROUND THE GLOBE	
09:30 - 10:50	Free paper session 7 (7x7 min.+3 min.)	Chair: Martina Sykorova
	Refreshment break, exhibition & poster viewing	
11:45 - 12:45	Public Systems of care and patient engagement	Chair: Sandro Michelini
	12:45 - 13:45 Lunch, exhibition & poster viewing	
	Refreshment break, exhibition & poster viewing	

THURSDAY 18 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
08:30 - 10:00	OPENING: Welcome by ILF/DSFS/DLF: Christine Moffatt, Susan Bermark and Tonny Karlsmark				
	PLENARY I: Wounds & Chronic oedema (Joint session of ILF & DSFS)	Chairs: Christine Moffatt & Susan Bermark			
08:30 - 08:49	Lymphoedema and wounds: The global perspective.	Christine Moffatt & Susan Bermark			
08:49 - 09:08	Wounds and chronic oedema: New evidence from the LIMPRINT study	Peter Franks*			
09:08 - 09:27	Cellulitis data from LIMPRINT	Ewa Burian			
09:27 - 09:46	Integrating idiopathic and allopathic approaches in lymphoedema management	S.R. Narahari*			
09:46 - 10:00	Questions & Answers				
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
10:30 - 12:00	PLENARY II: Wounds with lymphoedema (Joint session of ILF & DSFS)	Chairs: Tonny Karlsmark & Annette Høgh			
10:30 - 10:49	Clinical cases of wounds and lymphoedema	David Keast			
10:49 - 11:08	Klippel-Trénaunay syndrome and related disorders	Isabelle Quéré			
11:08 - 11:27	Diagnostic challenges in assessing PAD and lymphoedema with complex wounds	Guillaume Mahe*			
11:27 - 11:46	Wet Leg Pathway	Karen Morgan			
11:46 - 12:00	Questions & Answers				
12:00 - 13:30 Lunch, exhibition & poster viewing					
12:20 - 13:20	Industry sponsored symposium A		12:20 - 13:20	Industry sponsored symposium B	
13:30 - 15:00	Plenary III: Assessment and Diagnostics	Chair: Sandro Michellini	13:30 - 14:10	Workshop (pre-recorded): Ultrasonography for prediction of cellulitis in lymphoedema. Live Q & A	Chair: Tonny Karlsmark Misako Dai & Junko Sugama*
13:30 - 13:50	Comparison and contrast of different techniques and methods of assessment in lymphoedema	Vaughan Keeley*	14:15 - 15:00	Challenges and collaboration	Chair: Tonny Karlsmark
13:50 - 14:10	Imaging and interventions for lymphatic flow disorders in children	Yoav Dori	14:15 - 14:27	The New Era of the Minimally Invasive Plastic, Reconstructive and Aesthetic Procedures in the Best Practice for the Long-Lasting Recovering Cure of Lymphoedema & Lipedema	Corrado Campisi
14:10 - 14:25	A Proposed Diagnostic Pathway for Breast Cancer-Related Lymphedema (BCRL)	Cheryl Brunelle*	14:28 - 14:40	The comprehensive & effective treatment of Lymphedema and Related Disorders	Corradino Campisi
14:25 - 14:40	The Myths and the Evidence in Lymphedema: Precautionary Measures After Treatment for Breast Cancer	Alphonse Taghian*	14:40 - 14:52	The Advent of Lymphedema's Modern Era	William Repicci*
14:40 - 15:00	Questions & Answers		14:52 - 15:00	Questions and answers	
15:00 - 15:30 Refreshment break, exhibition & poster viewing					

*Online presentation

THURSDAY 18 NOVEMBER 2021

Meeting room 'Charlie', 1st floor		Hangar 1 (DSFS)	
		08:30 - 10:00	Joint session with ILF
10:00 - 10:30 Refreshment break, exhibition & poster viewing			
		10:30 - 12:00	Joint session with ILF
12:00 - 13:30 Lunch, exhibition & poster viewing			
		13:30 - 15:00	Kræftsår og andre specifikke sår (In Danish) Chair: Rikke Trangbæk
		13:30 - 14:00	Kræftsår - pleje og behandling Betina Lund-Nielsen
		14:00 - 14:25	Steroidcreme, steroidbehandling af eksem og sår, hvordan bruges de i praksis? Tove Agner
		14:25 - 14:50	Cancer i kroniske sår - en kasuistik Sophie Bojesen
		14:50 - 15:00	Spørgsmål og svar
15:00 - 15:30 Refreshment break, exhibition & poster viewing			

*Online presentation

THURSDAY 18 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
15:30 - 17:00	Cancer-related lymphoedema	Chair: Merete Wittenkamp	15:30 - 17:00	Lipoedema management I	Chair: Christoffer Nissen
15:30 - 15:42	Prospective Surveillance for Patients at Risk of Breast Cancer-related Lymphedema: Limb volume, function and quality of life results	Electra Paskett	15:30 - 16:00	Paradigm shift in Lipoedema and New International Consensus Document on Lipoedema	Tobias Bertsch
15:42 - 15:54	Cancer-related head and neck lymphoedema: Treatment techniques	Wouter Hoelen	16:00 - 16:15	Psycho-social aspects of lipoedema	Gabriele Erbacher
15:54 - 16:06	From Lymph to Fat – Lessons Learned During 25 Years of Complete Reduction of Lymphedema	Håkan Brorson	16:15 - 16:30	Lipoedema and pain	Robert Damstra
16:06 - 16:18	A palliative approach to cancer-related lymphoedema	Andrea Cheville*	16:30 - 16:45	Lipoedema: A genetic disease to know better	Sandro Michelini
16:18 - 16:30	Prevalence, incidence and risk factors of lower limb lymphoedema associated with gynaecological cancer	Sandi Hayes*	16:45 - 17:00	Questions and answers	
16:30 - 16:42	An explorative trial of pressure chamber treatment in early breast cancer-related lymphedema	Gunn Amnitzbøll			
16:42 - 17:00	Questions & Answers				
19:00 - 01:00 Conference dinner at Hangar 4+5					

*Online presentation

Meeting room 'Charlie', 1st floor			Hangar 1 (DSFS)		
15:30 - 17:00	Free paper session 1 (7x7 min.+3 min.)	Chair: Pinar Borman	15:30 - 17:00	Diabetiske fodsår (In Danish)	Chair: Jonas Askø Andersen
Complex chronic oedema case studies including chronic wounds			15:30 - 15:55	Diabetiske fodsår, patofysiologi	Klaus Kirketerp-Møller
15:30 - 15:40	Venous Leg Ulcers and Lymphedema: Means to improve the healing process	Joseph Harfouche	15:55 - 16:20	Ganganalyse	Jesper Bencke
15:40 - 15:50	Exploring the experiences of patients with primary and secondary non-cancer related lower limb lymphoedema and the impact on their lives	Mary Costello	16:20 - 16:45	Biofilm i sår	Thomas Bjarnsholt
International education			16:45 - 17:00	Spørgsmål og svar	
15:50 - 16:00	Lymphoedema International Health and Development Awareness (LIHDA): provision of compression garments aid and education in developing countries	Tamara Kosevic	17:00 - 18:00	Generalforsamling i Dansk Selskab for Sårheling (In Danish and members only)	
Patient collaboration and support					
16:00 - 16:10	Lymphedema management: A definition of the "Perfect" treatment	Evripidis Triantafyllou			
Prevention of pressure ulcers					
16:10 - 16:20	V Y advancement flaps in pressure sores	Vishal Mago*			
Venous leg ulcers: state of the art					
16:20 - 16:30	Randomized Study To Compare Efficacy Of Two Layer Compression Bandage Systems from KOB With Multi Layer Locally Used Cotton Crepe Bandages in The Treatment Of Venous Ulcers	Arun Gogia*			
Psychosocial and qualitative research					
16:30 - 16:40	The comparative evaluation of depression, life satisfaction and quality of life between patients with lipedema and lymphedema	Pinar Borman			
19:00 - 01:00 Conference dinner at Hangar 4+5					

*Online presentation

FRIDAY 19 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
07:30 - 08:15	Industry sponsored symposium C		08:30 - 10:00	Free paper session 3 (7x7 min. + 3 min.)	Chair: Tonny Karlsmark
08:30 - 10:00	Approaches to managing genital oedema	Chair: Melanie Thomas	Children with lymphoedema		
08:30 - 08:49	Presentation of results from new report and new film	Rhian Noble - Jones	08:30 - 08:40	European Reference Network for rare diseases (ERN): Pediatric and primary lymphedema network of European expert centers	Robert Damstra
08:49 - 09:08	Genital lymphoedema: Diagnostic and management considerations	Kristiana Gordon	08:40 - 08:50	Fitkids training guidelines for children with primary lymphoedema	Dijkstra Renske
09:08 - 09:27	Approaches to managing genital oedema: The Indian perspective	S.R. Narahari*	09:00 - 09:10	Evaluation of a specialist lymphoedema service for children and young people	Karl Hocking
09:27 - 09:46	Bandaging of genital lymphoedema	Pinar Borman	09:10 - 09:20	Spanish experience in lymphedema in childhood and young people	Vicenta Pujol-Blaya
09:46 - 10:00	Questions & Answers		Basic science and biology		
			09:20 - 09:30	Ways to collect lymphatic circulation in pathological conditions	Valikhan Khakimov
			09:30 - 09:40	Lymphatic function and morphology in the upper extremities of breast cancer treated women - a follow-up study	Andreas Johannessen
			09:40 - 09:50	Effect of Mechanical Ventilation on Peripheral Lymphatic Function - Do High Intrathoracic Pressure Reduce Lymphatic Flow?	Lene Thorup
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
10:30 - 12:00	PLENARY IV: Dilemmas on compression	Chairs: Christine Moffatt & Isabelle Quéré	10:30 - 12:00	Free paper session 4 (7x7 min. + 3 min.)	Chair: Jean-Paul Belgrado
10:30 - 10:45	An international study to explore the challenges faced by the medical device industry in the development and reimbursement of compression therapy	Christine Moffatt	Imaging and diagnostics including assessment strategies		
10:45 - 11:00	Compression use and Peripheral Arterial Disease	Isabelle Quéré	10:30 - 10:40	Gravity and Lymphodynamics	Thomas Holm-Weber
11:00 - 11:15	Compression in end of life and advanced disease	Andrea Chevillat*	10:40 - 10:50	Functional lymphatic reserve capacity is depressed in patients with a Fontan circulation	Sheyanth Mohanakumar
11:15 - 11:30	Consensus on compression of lipoedema	Tobias Bertsch	10:50 - 11:00	Dermal backflow, detected by near-infrared fluorescence lymphatic imaging, is a very accurate early prognostic of breast cancer-related lymphedema development	Melissa Aldrich*
			Outcome measures for lymphoedema		
			11:00 - 11:10	Early intervention with compression prevents short-term progression in mild breast cancer related arm lymphedema -A randomized controlled trial	Katarina Blom

*Online presentation

Meeting room 'Charlie', 1st floor			Hangar 1 (DSFS)		
08:30 - 10:00	Free paper session 2 (7x7 min.+3 min.)	Chair: Marina Cestari	08:30 - 10:00	Dermatologi (In Danish)	Chair: Ewa Burian
Lipedema			08:30 - 09:10	Hudplejemidler	Anne Vejrum Nielsen
08:30 - 08:40	Evaluation of Depression and Quality of Life in Patients with Lipedema	Aysun Akansel	09:10 - 09:30	Atypiske sår	Bo Jørgensen
08:40 - 08:50	LyQLI for assessment of Health-related Quality of Life in Patients with Lipedema pre and post liposuction: 1 year follow up	Valerie Yujin Kim	09:30 - 10:00	Hudpleje, syg og rask hud	Hanne Faarup
08:50 - 09:00	The correspondence between the localization of pain and the fat distribution type I-V in patients with lipoedema Part 1 of the results of the Dutch Lipoedema Survey	Wouter Hoelen			
09:00 - 09:10	Standard of Care for Lipedema in the United States	Karen Herbst*			
Psychosocial and qualitative research					
09:10 - 09:20	The experience of men diagnosed with chronic oedema and lymphoedema: a systematic qualitative meta-aggregation approach	Garry Cooper-Stanton			
Complex chronic oedema case studies including chronic wounds					
09:20 - 09:30	Different diagnostic and therapeutic approaches in lymphoedema of the elderly: role of the PRO-BNP in the modulation of treatment	Sandro Michelini			
Cancer-related lymphoedema					
09:30 - 09:40	Prevalence of axillary web syndrome and adhesive capsulitis in breast cancer: a retrospective study	Hui Zhen Aw*			
09:40 - 09:50	Effectiveness of compression sleeves in preventing breast cancer-related lymphoedema: a randomised controlled trial	Vincent Singh Paramanandam*			
10:00 - 10:30 Refreshment break, exhibition & poster viewing					
			10:30 - 12:00	Tryksår / Pressure Ulcers (In English)	Chair: Åse Fremmelev-holm
			10:30 - 11:40	Overview of the latest update of the PU guidelines	Dimitri Beeckman
				IAD (Incontinence Associated Dermatitis)	Dimitri Beeckman
			11:40 - 12:00	Legatuddeling (In Danish)	Susan Bermark

*Online presentation

FRIDAY 19 NOVEMBER 2021

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
11:30 - 11:45	Improving compliance in compression	Gabriele Erbacher	11:10 - 11:20	Exploring the Effectiveness of Lymphoedema Assessment Methods	Cheryl Pike
11:45 - 12:00	Questions & Answers		11:20 - 11:30	Patient reported outcome measures following liposuction for upper and lower limb lymphoedema	Adam Couves
			11:30 - 11:40	Is Debulking Surgery for Lymphedema Cost-effective?	Melissa Grandoff*
			11:40 - 11:50	American Lymphedema Framework Project (ALFP) Report on U.S. Health Professional Perspectives: A Partnership with the International Lymphoedema Framework (ILF) Chronic Oedema/ Lymphoedema Outcome Measures (COM) Project	Elizabeth Anderson*
12:00 - 13:30 Lunch, exhibition & poster viewing					
12:20 - 13:20	Industry sponsored symposium D		12:20 - 13:20	Industry sponsored symposium E	
13:30 - 15:00	Children with lymphoedema	Chair: Christine Moffatt	13:30 - 15:00	Free paper session 5 (7x7 min. + 3 min.)	Chair: Wouter Hoelen
13:30 - 13:45	The St George's Classification Algorithm of Primary Lymphoedema	Kristiana Gordon	Cancer-related lymphoedema		
13:45 - 14:00	Managing children with primary lymphoedema - an update	Isabelle Quéré	13:30 - 13:40	Treatment of breast cancer-related lymphedema with adipose-derived regenerative cells and fat grafting: an ongoing randomized, placebo-controlled and double-blinded clinical trial	Mads Jørgensen
14:00 - 14:15	Helping children live well with lymphoedema	Karl Hocking	13:40 - 13:50	The longitudinal course of breast edema in breast cancer patients treated with breast conserving surgery and radiotherapy - 1 year of follow-up	Nick Gebruers
14:15 - 14:30	Genetics of lymphoedema: An update	Miika Vikkula	13:50 - 14:00	Effect of therapeutic ultrasound on breast cancer related lymphedema: randomized single blind study	Burcu Duyur Cakit
14:30 - 14:45	Lymphatic dysfunction in Congenital Heart Disease	Vibeke Hjortdal	14:00 - 14:10	Effectiveness of manual lymph drainage, in addition to decongestive lymphatic therapy, for the treatment of breast cancer-related lymphoedema: secondary outcomes of a multi-centre randomised controlled trial (EFforT-BCRL trial)	Tessa de Vrieze
14:45 - 15:00	Questions & Answers		14:10 - 14:20	Threat of Breast Cancer-Related Lymphedema and Arm Use Intentions in a Prospectively Screened Cohort of Women Treated for Breast Cancer	Cheryl Brunelle
			14:20 - 14:30	Early Intervention for Breast Cancer-Related Lymphedema: Results from a Prospective Screening Program	Cheryl Brunelle
			14:30 - 14:40	Comparing Measurement Methods for Breast Cancer-Related Lymphedema Screening: The Need for Universal Agreement	Cheryl Brunelle
			14:40 - 14:50	Treatment of breast cancer-related lymphedema with topical tacrolimus: A prospective, open label, single-arm phase 2 pilot trial	Frederik Gulmark Hansen
15:00 - 16:15 Refreshment break, exhibition & poster viewing					
15:15 - 16:15	Industry sponsored symposium F		15:15 - 16:15	Industry sponsored symposium G	

*Online presentation

Meeting room 'Charlie', 1st floor			Hangar 1 (DSFS)		
12:00 - 13:30 Lunch, exhibition & poster viewing					
			13:30 - 15:00	Hudtransplantation (In Danish)	Chair: Bo Jørgensen
			13:30 - 13:45	Transplantatpleje Vest	Lærke Vindelbo Viggers
			13:45 - 14:00	Transplantatpleje Øst	Mitra Sepehri
			14:00 - 14:20	Forenklet bolus-bandagering på hudtransplantater - fordele	Michelle Mistry Igbokwe og Marianne Hass Lindahl
			14:20 - 14:35	Plenumdiskussion	Modereret af Bo Jørgensen
			14:35 - 14:55	Vækstfaktorer til at fremme sårheling	Marie Kristine Hjort
15:00 - 16:15 Refreshment break, exhibition & poster viewing					

*Online presentation

Hangar 4 & 5 - Streaming			Hangar 2 - Streaming		
16:15 - 17:45	Outcome Measures	Chairs: Christine Moffatt & Susan Nørregaard	16:15 - 17:45	Free paper session 6 (7x7 min. + 3 min.)	Chair: David Keast
16:15 - 16:34	Using the ILF wound COM in a skin integrity model in Nottingham, UK	Joanne Cooper	Cancer-related lymphoedema		
16:34 - 16:53	International Classification of Functioning (ICF) core set lymphoedema, what's next?	Wouter Hoelen	16:15 - 16:25	The comparison of manual lymph drainage, kinesio-taping, and low-level laser in addition to multi-layer bandaging, exercises, and skin care in patient with stage 2 breast cancer related lymphedema	F. Figen Ayhan
16:53 - 17:12	ILF Outcome Measures Project (ILF-COM)	Martina Sykorova	16:25 - 16:35	A Multi-centered Randomized Control Cross-over Study to Evaluate the Safety and Effectiveness of Koya Dayspring Active Mobile Compression System vs. an Advanced Pneumatic Compression Device for Treating Breast Cancer Related Lymphedema	Stan Rockson
17:12 - 17:31	Validation of the ILF wound COM in the UK	Ellie Dring	Genital oedema		
17:31 - 17:45	Questions & Answers		16:35 - 16:45	Genital edema education needs in the USA: a mixed method investigation.	Rhian Noble-Jones
			16:45 - 16:55	Pelvic Lymph Node Quantitative Study	Shelley DiCecco
			16:55 - 17:05	Self-reported knowledge, skill level, and confidence on evaluating and treating genital lymphedema among medical practitioners	Shelley DiCecco
			17:05 - 17:15	Female Genital oedema (FGO) Recognising incidence and early identification, leading to increased awareness and early treatment	Jane Wigg
			Other		
			17:15 - 17:25	Human Thoracic Duct Pressure and Intrinsic Contractions - Implications of mechanical ventilation	Benjamin Kelly
			17:25 - 17:35	Occupational Deprivations for Individuals Living with Lymphedema & Social Implications of Living with Lymphedema	Amanda Mohler*

*Online presentation

SATURDAY 20 NOVEMBER 2021

Hangar 5 - Streaming			Hangar 2 - Streaming		
07:30 CHARITY RUN & YOGA AROUND THE GLOBE					
09:30 - 10:30	Indocyanine green (ICG) fluoroscopy	Chair: Isabelle Quéré	09:30 - 10:30	Patient Session 1	Chair: Tonny Karlsmark
09:30 - 09:45	ICG - Near-Infrared Fluorescence Lymphatic Imaging	Jean-Paul Belgrado	09:30 - 09:45	Lipoedema from an endocrinological point of view	Jørgen Rungby
09:45 - 10:00	Using ICG scanning in supporting Lymphoedema Management	Cheryl Pike	09:45 - 10:00	Cellulitis data from LIMPRINT	Ewa Burian
10:00 - 10:15	ICG scanning: The gateway for Lymphatic Venous Anastomosis	Melanie Thomas	10:00 - 10:15	Infections; the experiences, the fear and the solutions from a patient point of view	Pernille Henriksen
10:15 - 10:30	Questions and answers		10:15 - 10:30	Questions and answers	
10:30 - 11:15	Industry Workshop A		10:30 - 11:45	Industry Workshop B	
11:15 - 11:45 Refreshment break, exhibition & poster viewing					
11:45 - 12:45	Self-managed challenges	Chair: Meadh McSweeney	11:45 - 12:45	Meet an Expert: Ask your questions and get an answer	Chair: Susan Nørregaard
11:45 - 11:57	Self-management & self-efficacy tools	Marina Cestari	11:45 - 12:45	- Tobias Bertsch - Håkan Brorson - Kristiana Gordon - Tonny Karlsmark - Christine Moffatt - Isabelle Quéré - Jørgen Rungby	
11:57 - 12:09	Lymphoedema self-care in resource poor settings - challenges for people affected by filariasis- and podoconiosis-related lymphoedema in rural Bangladesh and Ethiopia	Jan Douglass*			
12:09 - 12:21	View on living with primary lymphoedema and managing compression	Ellen Collard*			<i>Topics and cases discussed in this session must not be considered as advice to specific patients present.</i>
12:21 - 12:33	Teaching and learning self-management: findings from an ethnography of a lymphoedema summer camp	Alison Edgley			
12:33 - 12:45	Questions and answers				
12:45 - 13:45 Lunch, exhibition & poster viewing					

*Online presentation

Meeting room 'Charlie', 1st floor		
07:30 CHARITY RUN & YOGA AROUND THE GLOBE		
09:30 - 10:50	Free paper session 7 (7x7 min.+3 min.)	Chair: Martina Sykorova
Compression across lymphoedema and wound care		
09:30 - 09:40	Optimizing compression bandaging in lower limb edema? - a new device to monitor the effect of compression bandaging	Merete Celano Wittenkamp
09:40 - 09:50	Comparison of Coban and Coflex two-layer compression bandages for the treatment of lymphedema - pressure curves and comfort	Nick Gebruers
09:50 - 10:00	Compression in unusual edema localisation	Franz-Josef Schingale
10:00 - 10:10	Value and limits of the elastic bandage and the elastic garment in Lymphoedema and Lipedema: different therapeutic approaches for different objectives	Sandro Michelini
10:10 - 10:20	Preventing lower limb cellulitis through compression therapy: Results of a randomised controlled trial	Elizabeth Webb*
Other		
10:20 - 10:30	The important role of patient education in developing secondary lymphedema after breast cancer and gynecologic cancer surgery	Secil Pervane Vural
10:30 - 10:40	Climate change and climatic variation impact on chronic oedemas: a systematic review	Susan Witt
10:40 - 10:50	COVID-19 and lymphedema patients: first results and conclusions	Aleksandra Rovnaya
Refreshment break, exhibition & poster viewing		
11:45 - 12:45	Public Systems of care and patient engagement	Chair: Sandro Michelini
11:45 - 11:57	The achievements and lessons learned from conducting LIMPRINT in Italy	Sandro Michelini
11:57 - 12:09	Therapeutic education	Pinar Borman
12:09 - 12:21	Value Based Lymphoedema Healthcare and the creation of LYMPROM (Patient Reported Outcome Measures)	Melanie Thomas
12:21 - 12:45	Questions and answers	
12:45 - 13:45 Lunch, exhibition & poster viewing		

*Online presentation

SATURDAY 20 NOVEMBER 2021

Hangar 5 - Streaming			Hangar 2 - Streaming		
13:45 - 15:15	Lipoedema Management II	Jørgen Rungby	13:45 - 15:15	Patient Session 2	Chairs: Pernille Henriksen & Susan Nørregaard
13:45 - 14:00	Phenotypes of Lipoedema	Isabel Forner-Cordero*	13:45 - 13:57	Exercise and movement	Rhian Noble-Jones
14:00 - 14:15	Lipoedema from an endocrinological point of view	Jørgen Rungby	13:57 - 14:09	Compression and me!	Karen Morgan
14:15 - 14:30	Physio- and movement therapy for the lipoedema patient	Ad Hendrickx	14:09 - 14:21	My compression story	Ellen Collard*
14:30 - 14:45	Consensus of the European lipoedema forum: Liposuction for the treatment of lipoedema, yes, but...	Nestor Torio-Padron	14:21 - 14:33	Skin care and massage	Cheryl Pike
14:45 - 15:00	Impact of bariatric surgery on Lipoedema	Jodok Fink	14:33 - 14:45	The biggest barrier to self-management is me!	Karl Hocking
15:00 - 15:15	Questions and answers		14:45 - 14:57	Taking control in my lymphoedema appointment	Melanie Thomas
			14:57 - 15:15	Questions and answers	
15:15 - 15:45 Refreshment break, exhibition & poster viewing					
15:45 - 16:15	Closing		15:45 - 16:15	Closing	

*Online presentation

INDUSTRY



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The compression system is designed to provide compression to the leg for patients with venous and lymphatic disorders.



Industry Symposium A: medi

Room Hangar 4 & 5

Time Thursday 18 November 12:20 - 13:20

Title

Compression in Lymphedema, lipedema and arterial diseases

Speaker

Dr. Franz-Josef Schingale

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- ▶ Easy to apply at full stretch, reduces inconsistency of pressure
- ▶ One size fits all reducing complexity and cost
- ▶ Therapeutic compression without the bulk so patients remain active
- ▶ Overall comfort and mobility leads to increased patient concordance³
- ▶ Sustains effective compression for up to 7 days⁴

References

- 1 Multi-centre case series using a Two-Layer Reduced Compression Bandage in the treatment of challenging lower limb wounds of venous and mixed aetiology.
- 2 EU-CLIN-ICS-Report-05-000008.
- 3 Moffatt C *et al* (2012) 'A preliminary randomized controlled study to determine the application frequency of a new lymphoedema bandaging system.' *British Journal of Dermatology* 166.3: 624–632.
- 4 EU-CLIN-ICS-Report-05-000009.

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Industry Symposium B: 3M

Room Hangar 2

Time Thursday 18 November 12:20–13:20

Title

Experiences from a private lymphoedema clinic, managing cases with a 2 layer cohesive compression system

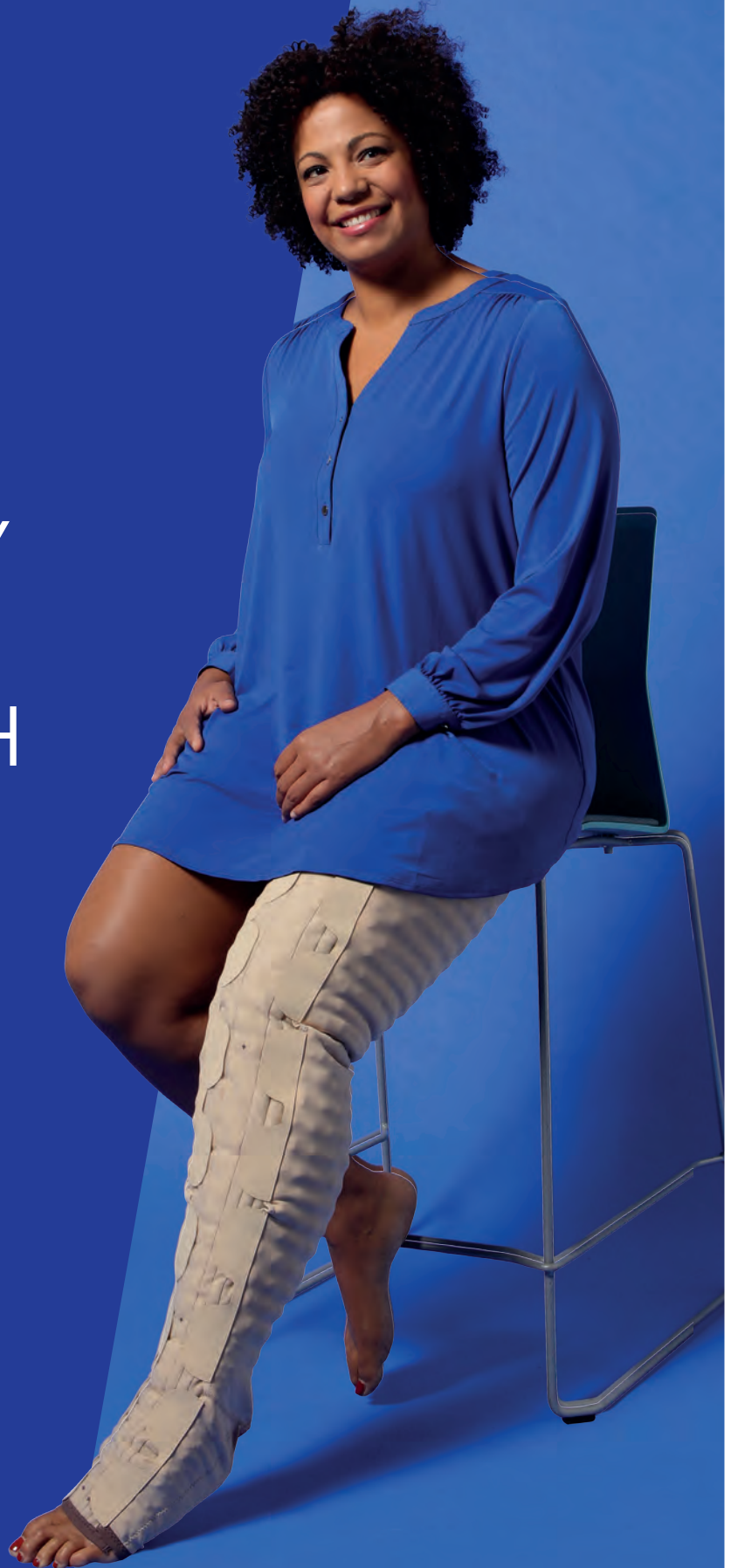
Speaker

Tim Decock



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Industry Symposium C: Thuasne

Room Hangar 4 & 5

Time Friday 19 November 7:30–8:15 AM

Everything you always wanted to know about Sex and Lymphedema.
New clinical study: OLYMPY

Title	Speaker
The incidence of genital lymphedema in women's life	Dr Julie MALLOIZEL
The incidence of genital lymphodema in men's life	Dr Caroline FOURGEAUD
A new solution to treat genital lymphedema: First results of OLYMPY study	Dr Sandrine MESTRE



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Industry Symposium D: Juzo

Room Hangar 4 & 5

Time Friday 19 November 13:30-15:00

Title

16 år og primært lymfødeme (in Danish)

Speaker

Julie Paulin



JOBST®

JOBST® Symposium

**From differential diagnosis
to personalized treatment**

Dr. Tobias Bertsch

Senior Physician Foeldi-Clinic, European Center for
Lymphology, Black Forest, Germany

12.20 - 12.45

Three of a kind?
Differentiating between lipedema, obesity
and lymphedema

12.45 - 12.50

Q&A

Justine Whitaker

Director and Nurse Consultant, Northern Lymphology,
United Kingdom

12.50 - 13.15

Personalized treatment of lymphedema and
lipedema with JOBST Confidence (Case Reports
and outlook)

13.15 - 13.20

Q&A

For further
information
please visit
us at
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No. 1

Lunch boxes will be served
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Industry Symposium E: JOBST

Room Hangar 2

Time Friday 19 November 12:20-13:20

From differential diagnosis to personalized treatment

Title	Speaker	Speaker
Three of a kind? Differentiating between lipedema, obesity and lymphedema	Dr. Tobias Bertsch	Senior Physician Foeldi-Clinic, European Center for Lymphology, Black Forest, Germany
Personalized treatment of lymphedema and lipedema with JOBST Confidence (Case Reports and outlook)	Justine Whitaker	Director and Nurse Consultant, Northern Lymphology, United Kingdom

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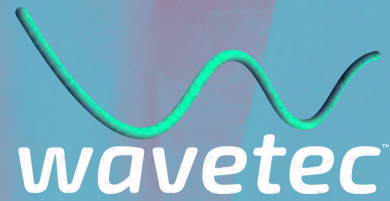
Industry Symposium F: SIGVARIS GROUP

Room Hangar 4 & 5

Time Friday 19 November 15:15–16:15

Title	Speaker	Moderator
SIGVARIS GROUP Inelastic Compression Wraps Evaluation	Tracy Green, SIGVARIS GROUP Clinical Manager, (MSc, BSc(Hons), DPSN(DN), RN)	Sylvain Gaillard

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PULSE & FLOW



Industry Symposium G: Twinery

Room Hangar 2

Time Friday 19 November 15:15–16:15

Expert Sessions on IPC for lymphedema management

Title	Speaker
Pathophysiology of lymphedema	Prof Shervanthi
Current lymphedema care modalities Accessibility issues due to covid 19 Drawbacks of devices	Mary Calys
wavetec™ product Available clinical data on efficacy of wavetec™ Med+ Invitation to Collaboration + future	Dr Angelo

WORKSHOP

JOBST Workshop

Room Hangar 5

Time Saturday, 20th November 2021 at 10:30



JOBST Workshop
Saturday, 20th November 2021
at 10:30-11:00

Hangar 5

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Be invited to discover exclusive insight into the development and technical background of JOBST' latest innovation:

JOBST Confidence panty!

- Which technical innovation makes JOBST Confidence unique?
- How comes that JOBST Confidence can answer both lymphedema and lipedema patients' needs?

Fast'n Go Workshop

Room Hangar 2

Time Saturday, 20th November 2021 10:30



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Workshop Fast'n Go, Hangar 2, Saturday at 10:30 AM

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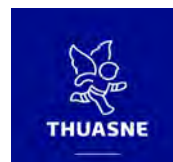
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32	<p>Juzo www.juzo.com</p> 	<p><i>Who are we? That's simple! We are more than 1,000 employees who work together across the world. As specialists in compression therapy, we have made it our mission to improve patients' quality of life and provide lasting relief from their symptoms. To achieve this, we are constantly developing new, intelligent products to meet our customers' individual requirements and ensure that treatment is successful. We have already been pursuing this goal for over 100 years and are always looking out for new solutions in phlebology, lymphology, scar management and orthopaedics. Every day we are working on something new to make the impossible possible and make movement more joyful.</i></p>
GOLD		
17	<p>3M www.3m.com</p> 	<p><i>At 3M, we apply science in collaborative ways to improve lives daily. Our 90,000 employees connect with customers all around the world in our local subsidiaries. Extensive research, design and testing led 3M scientists to develop 3M™ Coban™ 2 Layer Compression System - a breakthrough in compression bandaging with the potential to change the practice of lymphedema intensive therapy.</i></p>
18	<p>medi www.medi.de/en</p> 	<p><i>medi GmbH & Co. KG in Germany is one of the world's leading manufacturers of medical aids. medi supplies the following products: medical compression stockings for treatment of venous disorders (i.e. varicose veins, DVT, etc.); anti-embolism stockings for thrombosis prophylaxis in hospitals; lymphoedema sleeves and stockings; wound care products; orthopaedic products: braces and supports; orthopaedic insoles; compression sport socks. Most of the products are made in Germany and are certificated with ISO 9010.</i></p>
2	<p>Sigvaris Group www.sigvaris.com</p> 	<p><i>The SIGVARIS GROUP has its headquarters in Switzerland and is the global market leader in the manufacture of medical compression garments. It employs over 1,550 people and has its own production plants in Switzerland, France, Poland, the US and Brazil. SIGVARIS GROUP is close to its customers, having subsidiaries in Germany, Austria, England, Italy, Canada, China, Australia, Mexico and a branch in the United Arab Emirates as well as distributors in more than 70 countries on all continents. SIGVARIS GROUP pursues an international growth strategy on the solid foundation of more than 150 years of success.</i></p>
7	<p>Twinery www.twinery.co</p> 	<p><i>MAS Holdings is South Asia's largest manufacturer of intimatewear and sportswear, counting over 30 years of experience working alongside leading apparel brands in the US and EU. As the source of innovation for MAS, Twinery combines knowledge of the human body with unparalleled expertise in fabrics and textiles to launch novel solutions that champion consumer needs. We specialize in next-to-skin technology manufacturing.</i></p> <p><i>SPRYNG is a wearable active compression device nurtured in Twinery that will revolutionize accessibility & delivery of intermittent compression to a wide medical audience, around improving circulation, reduced swelling & recovery. SPRYNG is a first to world consumer-centric pneumatic compression device, completely untethered with no wires or tubes. The user can carry SPRYNGs anywhere (on the move or while relaxing at home) & experience advanced compression therapy. SPRYNG improves circulation to manage lymphoedema, DVT, venous disorders, leg swelling & soreness & recovery.</i></p>

No.	Company	Company description
SILVER		
-	<p>Aria Health www.ariahealth.com</p> 	<p><i>Aria Health™ was founded to provide freedom and flexibility to the millions of people facing the challenges and burdens of treating lymphedema and other chronic edema. By removing barriers to therapy, and providing a lightweight, easy-to-use, at-home device with virtual support, Aria Free™ can help people manage lymphedema symptoms and improve health outcomes.</i></p>
6	<p>Bauerfeind www.bauerfeind.com</p> 	<p><i>Bauerfeind AG is one of the leading manufacturers of medical aids such as supports, orthoses, compression stockings and foot orthoses. The high-quality products with the respected "Made in Germany" label make an important contribution to maintaining and restoring health and are available from the specialty medical retailers who are quality partners.</i></p>
30	<p>Haddenham Healthcare www.hadhealth.com</p> 	<p><i>Haddenham Healthcare are specialists in providing proven and market leading products for the treatment of patients with Lymphoedema, Lipoedema, Chronic Oedema and Wound Care.</i></p>
23	<p>Thuasne www.thuasne.com</p> 	<p><i>At the strategic intersection of medicine, materials and digital technologies, Thuasne creates and distributes health solutions in order to empower everyone to take an active part of their own health. Strong of its expertise in medical compression, Thuasne offers a wide range of solutions to treat wisely lymphedema.</i></p>

SPONSOR DIRECTORY

No.	Company	Company description
BRONZE		
31	<p>Arion Slide Solutions www.arion-group.com/brands/arion-slide-solutions/products</p> 	<p><i>Arion Slide Solutions is the expert in application aids for medical compression garments since 1994. Thanks to their unique sliding properties, Arion donning and doffing aids minimize friction between compression garment and skin and make it easier to put it on and off. Arion application aids are compact, light-weight, and especially designed for different types of compression garments as well as for different shapes and sizes of limbs. They are easy to use, safe to apply, and offer simple solutions for compression wearers and their caregivers to help them face the challenge of compression therapy – every day.</i></p>
-	<p>Cizeta Medicali www.cizetamedicali.com</p> 	<p><i>Cizeta Medicali S.p.A. is the italian leader manufacturer of medical stockings, with a policy based on a continuous research of new solutions for venous and lymphatic deseases, identified in innovative and high quality products, certified by prestigious International institutions.</i></p>
21	<p>Fysiodema www.fysiodema.dk</p> 	<p><i>Fysiodema ApS distributes medical devices aimed at diagnosing and treatment of lymphedema (LymphaTouch) and rehabilitation (AlterG) in Denmark and Sweden. SOZO is an evidence based medical device for screening and diagnostic of lymphedema from Australian Impedimed Inc. Continuous measurement of the Lymphedema has in trials shown that the development of lymphedema can be measured and thus controlled with SOZO and treated with LymphaTouch. Our mission is to make the best products available for the patients.</i></p>
21	<p>LymphaTouch www.lymphatouch.com</p> 	<p><i>LymphaTouch Inc. is a pioneering Finnish healthcare technology company developing a treatment device based on negative pressure. It has several treatment areas, including lymphedema, pre- and postoperative swelling and scarring, fascial tightness, muscle maintenance, active recovery, pain management and improving joint functionality.</i></p>

EXHIBITORS

No.	Company
25	Abigo www.abigo.dk
36 Hangar 3	B.Braun www.bbraun.com
4C	BÖSL www.boesl-med.de
27	Coloplast www.coloplast.com
9	Convatec www.convatec.dk
35 Hangar 3	EVOLAN www.evolan.se/en
19	Fast'n Go www.thonic.care/en
4A	Fibralign www.fibralignbio.com
33 Hangar 3	HandyLegs www.eu.handylegs.com
3	Huntleigh www.huntleigh-diagnostics.com
11	Icompression www.icompression.dk
34 Hangar 3	JHInova www.jhinova.se

No.	Company
16	LEVABO www.levabo.dk/en
24	Limbo www.limboproducts.com
22	L&R www.lohmann-rauscher.com
28	Lymed www.lymed.fi
29	Lympha Press www.megoafek.com
5	MEDIQ www.mediqdanmark.dk
13	Mölnlycke www.molnlycke.dk
20	new feet www.new-feet.com
37 Hangar 3	OneMed www.onemed.dk
26	Reapplix www.reapplix.com
4B	Smith+Nephew www.smith-nephew.com
14	ZiboCare www.zibocare.dk

PARTNER ORGANISATIONS

No.	Company
Foyer	JWC www.magonlinelibrary.com/journal/jowc

No.	Company
Foyer	LipoedemaUK www.lipoedema.co.uk

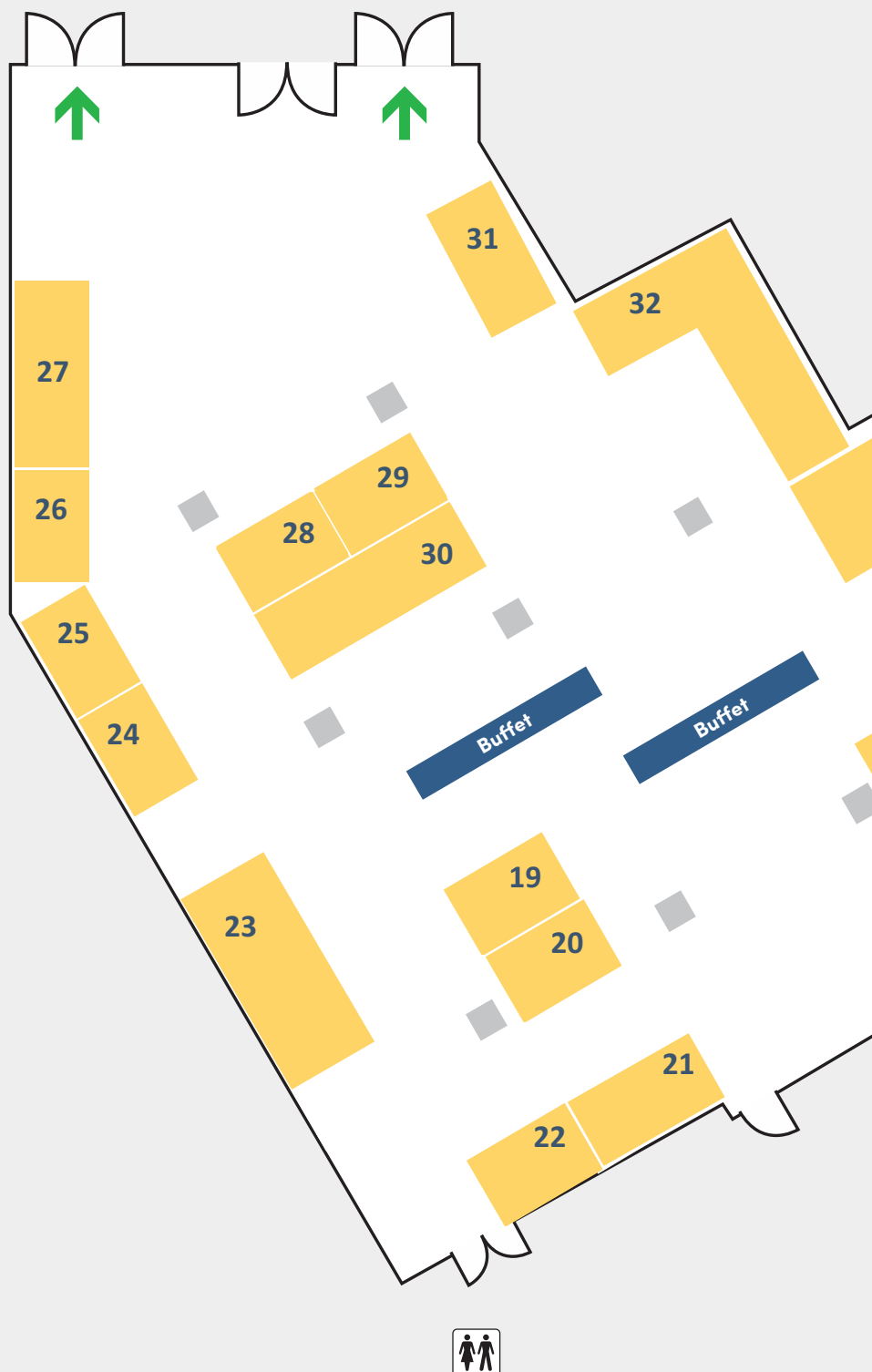
EXHIBITION FLOOR PLAN

EXHIBITORS FOYER

1	JOBST
2	SIGVARIS GROUP
3	Huntleigh
4A	Fibralign
4B	Smith+Nephew
4C	BÖSL
5	MEDIQ
6	Bauerfeind
7	Twinery
9	ConvaTec
11	Icompression
13	Mölnlycke
14	ZiboCare
16	LEVABO
17	3M
18	medi
19	Fast'n Go
20	new feet
21	Fysiodema
21	LymphaTouch
22	L&R
23	Thuasne
24	Limbo
25	Abigo
26	Reapplix
27	Coloplast
28	Lymed
29	Lympha Press
30	Haddenham Healthcare
31	Arion Slide Solutions
32	Juzo
-	JWC
-	LipoedemaUK

EXHIBITORS HANGAR 3

33	HandyLegs
34	JHInova
35	EVOLAN
36	B.Braun
37	OneMed







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INVITED SPEAKER ABSTRACTS



PLENARY I: WOUNDS & CHRONIC OEDEMA (JOINT SESSION OF THE ILF & DWHS)

Peter Franks: Wounds and chronic oedema: New evidence from the LIMPRINT study

Chronic leg oedema and wounds are frequently seen in populations, but the relationship has rarely been considered. The LIMPRINT study database was used to examine differences in patients with and without wounds, all of whom were suffering from chronic oedema.

Of 7077 patients in with chronic leg oedema, 12-70% also had a leg wound. Independent risk factors for the presence of a wound were: peripheral arterial disease (Odds Ratio, OR 4-87), cellulitis within the past 12 months (OR 2-69), secondary lymphoedema (OR 2-64), being male (OR 2-08), being over 85 years of age (OR 1-80), underweight (OR 1-79), bed bound (OR 1-79), chair bound (OR 1-52), diabetic (OR 1-47) and walking with aid (OR 1-41). Well-controlled oedema was associated with lower presence of a wound (OR 0-50). Hard/fibrotic tissue (OR 1-71) and a positive Stemmers sign (OR 1-57) were also associated with wounds.

There is a strong association between chronic leg oedema and wounds. Controlling swelling was associated with a lower risk of leg wounds.

Ewa Burian: Cellulitis data from LIMPRINT

Cellulitis is a common and potentially serious bacterial infection of the skin, often leading to hospitalization, long-term morbidity and recurrent disease. It has been reported to account for over 1% of the emergency admissions, and is regarded as one of the leading causes of potentially preventable hospitalizations. Chronic oedema has previously been known to be a predisposing factor for cellulitis, but the number of studies designed to investigate this relationship have been few. In this talk, Dr. Burian will present the cellulitis data from the LIMPRINT study, including 7477 patients with clinically assessed chronic leg oedema. What is the extent of the problem of cellulitis in chronic oedema on an international level? What risk factors for cellulitis were identified? And how can we prevent it? These questions will be answered, including a hypothesis of why swelling of the legs predispose to the development of cellulitis.

S.R. Narahari: Integrating idiopathic and allopathic approaches in lymphoedema management

All testicular swellings and scrotal oedema due to Lymphatic Filariasis (LF) are not hydroceles. The amount of tissue fluid in the genital tissues varies with posture and time of day.

We managed eight genital lymphoedema cases, three females and five males. The treatment included self-care, i.e., ayurvedic oil massages, compression therapy and a particular sequence of yoga exercises.

Five yoga exercises are done that may facilitate inguinal lymph node drainage and abdominal drainage. This yoga also increases abdominal pressure. Shashanka asana (shashanka= deer), Manduka asana (manduka= frog), Koorma asana (koorma= tortoise), Ardhamatsyendra asana (Ardha = half, matsyendra = king of fishes) are given to attain abdominal drainage. However, patients were not satisfied with the treatment and opted for reconstructive surgery. All patients were satisfied after the surgery. One patient conceived after the reconstructive surgery, and the genital lymphoedema did not worsen during the lactation period.

PLENARY II: WOUNDS WITH LYMPHOEDEMA (JOINT SESSION OF THE ILF & DWHS)

David Keast: Clinical cases of wounds and lymphoedema

Chronic edema/lymphedema and its relationship to chronic wounds particularly of the lower extremity is underrecognized and undertreated. Data involving a total of 21,253 patients in 11 countries who met the criteria of chronic edema lasting more than 3 months were reviewed. Overall prevalence of wounds was 32.7%. Wounds were primarily seen in patients with complex lower extremity chronic edema who were older and had multiple co-morbid conditions. Clinical cases will be presented. To develop treatment plans requires a complete assessment of the wound, the patient and their environment.

Isabelle Quéré: Klippel-Trénaunay syndrome and related disorders

Maurice Klippel and his student made a clinical analysis of complex vascular malformation of the lower limbs associated with overgrowth of the bone and the surrounding tissues in the 19th century. The eponymic definition of Klippel-Trenaunay syndrome has been used since. It's been more recently classified within the PROS clinical spectrum of the anomalies associated with a gain of function variants in the PIK3CA gene. A review of the diagnosis criteria and of the new therapeutic options is done through the presentation of clinical cases.

Guillaume Mahe: Diagnostic challenges in assessing PAD and lymphoedema with complex wounds

This presentation will focus on the different means to diagnose lower extremity peripheral artery disease after a short overview of the different clinical presentations of the disease.

What are the means to diagnose PAD? Should I perform ankle-brachial index (ABI), Toe-Brachial Index (TBI), analyze arterial Doppler waveforms, or oximetry? What are the drawbacks of the different means? This presentation will be based on the different international guidelines.

Karen Morgan: Wet Leg Pathway

The Chronic Oedema Wet Leg Pathway©2017 was an output from the On the Ground Clinical Lymphoedema Educator Pilot Project (OGEP) 2016. Originally, the pathway provided three levels of bandaging to support effective management of patients affected with chronic oedema and lymphorrhoea (wet legs) thereby reducing complications.

The decision pathway provides clear evidenced-based literature to registered nurses and health care support workers to deliver timely and prudent care for people with chronic oedema and lymphorrhoea. Following the pathway can reduce patients' distress, improve quality of life and enhance wound care effectiveness. It will also decrease the likelihood of hospital admissions from cellulitis.

This session will present the updated Chronic Oedema Wet Leg Pathway©2021 demonstrating the evidence and rationale for the introduction of a fourth level of bandaging.

PLENARY III: ASSESSMENT AND DIAGNOSTICS

Vaughan Keeley: Comparison and contrast of different techniques and methods of assessment in lymphoedema

This presentation focuses on the use of methods to detect chronic oedema and assess its extent. It includes those, which may be helpful in clinical practice in determining appropriate treatment as well as in research.

The main techniques discussed are limb volume measurements, bioimpedance and tissue dielectric constant. Limb volume measurements are routinely used in clinical practice, mainly by tape measure methods, to aid in the assessment of the severity of swelling to determine treatment options, as well as the response to treatment. In research more accurate methods such as water displacement and the Perometer may be needed.

Bioimpedance is more commonly used in the early detection of lymphoedema e.g. after breast cancer treatment but can be used to monitor the response to treatment. Tissue dielectric constant measurements are particularly helpful in assessing localized swelling e.g. in midline areas such as head and neck and breast oedema.

Yoav Dori: Imaging and interventions for lymphatic flow disorders in children

In recent years there has been a resurgence of interest in the lymphatic system driven by advances in lymphatic imaging and interventions. The lymphatic system plays a crucial role in immune regulation, fat absorption, and tissue fluid recirculation. Dysregulation of lymphatic fluid flow can lead to lymphatic leaks, tissue congestion, lymphedema, and related symptoms. Patient with certain types of congenital heart disease, elevated central venous pressure, or congenital lymphatic conduction abnormalities are particularly susceptible to lymphatic derangements such as chylothorax, plastic bronchitis, protein losing enteropathy and ascites. Historically, a lack of lymphatic imaging and interventional techniques led to poor understanding of these disease and poor outcomes. However, this has now changed, and new lymphatic imaging and interventional techniques have resulted in improved understanding of the etiology of these diseases and improved outcomes for these patients.

Cheryl Brunelle: A Proposed Diagnostic Pathway for Breast Cancer-Related Lymphedema (BCRL)

Prospective screening for BCRL incorporates subjective and objective measurements which allow for early diagnosis and intervention. However, varied diagnostic criteria for BCRL exist, and lack of consensus leads to variation in screening and diagnosis across institutions. There is sufficient evidence to develop guidelines in this area to work toward universal BCRL diagnostic criteria. Current subjective and objective screening methods and diagnostic thresholds will be reviewed, including the merits and challenges of each. Based on available evidence, a proposed clinical pathway for BCRL diagnosis will be presented. Ultimately, the BCRL diagnostic process should be universalized and combine patient-reported outcome measures, objective measurements, and clinical evaluation whilst adhering to best practices of the measurement tools used.

Alphonse Taghian: The Myths and the Evidence in Lymphedema: Precautionary Measures After Treatment for Breast Cancer

Evidence shows that medical procedures in the at-risk arm, including venipuncture and blood pressure measurements, are not associated with increased arm volume in the presence of a BCRL screening program. In spite of lack of supporting data, patients have been advised for years to avoid many activities of the arm at risk for BCRL. Furthermore, some patients are at bilateral risk of BCRL after bilateral lymph node surgery, yet may require medical procedures in the arm. These recommendations negatively impact quality of life and are not evidence-based. Common myths and current evidence around precautionary measures after breast cancer will be presented. Prospective BCRL screening and comprehensive patient education is paramount to empower patients to make informed decisions and to detect BCRL at its early stages for those at risk.

CHALLENGES AND COLLABORATION

Corrado Campisi: The New Era of the Minimally Invasive Plastic, Reconstructive and Aesthetic Procedures in the Best Practice for the Long-Lasting Recovering Cure of Lymphedema & Lipedema

Lymphedema, Lipedema and mixed patterns of Lipo-Lymphedema represent a hard challenge for plastic surgeons and related interdisciplinary professional supporters engaged in the fight against these life-threatening conditions.

Today, Centers with properly integrated multi-interdisciplinary task force, can reach in the minimally invasive plastic, reconstructive and aesthetic procedures a true key of success in the best practice for the tailored long-lasting recovering cure of these tying pathologies.

The Genoa experience represents an important example of the present new era.

The Genoa wide clinical registry and data concerning long-term results are presented and offered to the evaluation of the ILF Conference in Copenhagen.

Corrado Campisi: The comprehensive & effective treatment of Lymphedema and Related Disorders

Lymphedema and related disorders, according to the different aetiology, clinical manifestations, staging and diagnostic imaging, represent often a very difficult context for the comprehensive and effective treatment of the multiple patterns of these diseases, above all considering advanced stages, elephantiasis evolution of the pathology, and not only regarding secondary or acquired forms, moreover on oncological basis, but also looking at complex and intricate congenital or primary malformative expressions of the lymphostatic diseases, sometimes extended from the peripheral anatomic body regions to the abdomen, the thorax and to head-neck areas.

Author presents his long-life school large experience, Genoa protocol of the complete functional therapy and long-term results, with special preference, if and when possible, to the most minimally invasive procedures.

William Repicci: The Advent of Lymphedema's Modern Era

Lymphedema (LE) has been called the "invisible" or "polite" disease. It has been a disease often said in whispers, if at all. Many patients were likely to spend their lives never having received a proper diagnosis. Others would be subdued into silence by a medical community suggesting it would be untoward for them to complain. However, in the last decade, there has been an unraveling of the causes that led to LE being largely ignored, followed by a profound shift in the level of advocacy by a passionate LE community. This talk will explore the reasons for this palpable excitement as lymphedema takes its place as a global priority.

CANCER-RELATED LYMPHOEDEMA

Electra Paskett: Prospective Surveillance for Patients at Risk of Breast Cancer-related Lymphedema

Breast cancer-related lymphedema (LE) is a debilitating effect of treatment. Few LE risk-reduction studies have been conducted in women receiving axillary node dissection for breast cancer treatment. The LEAP study, conducted in the National Cancer Institute clinical trials network (CALGB 70305 – Alliance), tested an education plus sleeve compression/exercise intervention compared to education-only. Outcomes included change in arm volume measurements, quality of life (QoL), and range of motion (ROM) by 18 months after baseline. A total of 554 women were randomized based on the assignment of their treating institution. No differences in limb volume or QoL were found; however, ROM returned faster in the intervention group, perhaps due to early referral to physical therapy. Black women reported greater impacts on QoL because of LE symptoms. Future studies testing LE risk-reduction strategies should include early referral to physical therapy; attention to LE in women of color should also be a priority.

Wouter Hoelen: Cancer-related head and neck lymphoedema: Treatment techniques

Introduction:

Having to deal with head and neck cancer as being one of the most devastating forms of cancer can be challenging for patient and health care professionals. Dealing with the comorbidity of cancer interventions in my opinion needs a multidisciplinary approach to achieve the best outcome and quality of life perspectives. Oncology Physiotherapy plays a key-role in the treatment of this condition.

Objectives: This presentation will use a patient journey to explain how clinical reasoning using a 'prospective surveillance model' can be helpful for the monitoring of patients dealing with both internal and external lymphoedema, pain, fatigue, scarring, nutrition, communication as well as condition related psychosocial issues. Every aspect relevant for an optimal treatment will be explained in detail and a combination of lymphatic drainage techniques and fascia release techniques (hands-on and self-management) will be demonstrated and discussed.

Håkan Brorson: From Lymph to Fat – Lessons Learned During 25 Years of Complete Reduction of Lymphedema

INTRODUCTION: Patients with chronic non-pitting lymphedema do not respond to conservative treatment because of early deposition of excess adipose tissue due to chronic inflammation. Microsurgical reconstructions, in contrast to liposuction, cannot provide complete reduction. To remove the excess adipose seems thus to be a logical treatment strategy. This prospective study describes the long-term outcome of liposuction of arm and leg lymphedema.

METHODS: 190 women with arm and 126 patients with leg edema underwent liposuction followed by compression with garments.

RESULTS: Arms: Preoperative mean excess volume was 1411±52mL. Postoperative mean reduction was 104±2.0% at 3 months and 116±2.1% at 1 year, and more than 100% during 25 years' follow-up. Legs: Preoperative excess volume was 3489±155mL Postoperative mean reduction was 82±2.4% at 3 months and 101±2.2% at 1 year, and more than 100% during 15 years' follow-up. A slight overcorrection was seen in both groups.

CONCLUSION: Liposuction is an effective method for treatment of chronic, non-pitting arm lymphedema with long-lasting results. Removing the hypertrophied adipose tissue is a prerequisite to achieve complete reduction.

Andrea Cheville: A palliative approach to cancer-related lymphoedema

Palliative care has been highlighted as integral to the comprehensive, high value management of chronic and progressive medical conditions. Much attention has focused on cancer where palliative care's early integration has been shown to improve quality of life and, even, survival. However, increasingly palliative care is considered a critical dimension of care, independent of diagnosis, when patients experience intense symptoms and psycho-emotional distress, navigate treatment tradeoffs and ambiguity, or confront terminal disease. Multifactorial edema is prevalent among patients receiving palliative care, and its management is important to optimize comfort, safety, and function. However, conventional approaches to decongestion must be modified based on patients' goals, preference, tolerance, and medical vulnerability. Additionally, palliative contexts are frequently marked by rapid shifts in prognoses and treatment plans necessitating flexibility on the part of the lymphedema therapist. Systemic contributors to edema; solid organ function, medications, and inflammation, among others, may also be highly dynamic. This presentation will provide a brief overview of the assessment essentials for the appropriate management of lymphedema in the palliative setting. Common CDT treatment modifications will be described, as will strategies to increase effectiveness and safety.

Sandi Hayes: Prevalence, incidence and risk factors of lower limb lymphoedema associated with gynaecological cancer Understanding about incidence and risk factors associated with lymphedema following gynaecological cancer is unclear, with study design, lymphedema measurement methods and sample characteristics influencing study findings. The LEGS study was a longitudinal, prospective, gynaecological cancer cohort study that involved 408 women diagnosed with endometrial, ovarian, cervical, or vulvar/vaginal cancer. Lymphoedema status was assessed (via self-report, clinical diagnosis, bioimpedance spectroscopy and circumferences) pre-surgery and at 6-, 12- and 24-months post-surgery. Throughout the presentation, findings related prevalence, incidence and risk factors will be presented by cancer type and measurement method. Further, how these findings can inform current practice, as well as priority areas for future research will be discussed.

Gunn Amnitsbøll: An explorative trial of pressure chamber treatment in early breast cancer-related lymphedema

This study explored the effect of Hyperbaric Oxygen Therapy (HBOT) in women with early stage BRLE.

Patients treated for breast cancer with axillary dissection and radiotherapy who experienced BCRL one year after surgery were invited. Participants received 40 sessions of 90-minute pressure exposures at 2,4 Bar while breathing 100% oxygen. Symptoms and function were assessed by validated scales, BRLE by Dual Energy X-Ray Scans and lymphatic clearance by lymphoscintigraphy with a 6-month follow-up.

19 participants were enrolled, all completing 6-month follow-up. We found overall clinically relevant improvements in patient-reported outcomes for symptoms and function. There was no change in arm mass ($\beta=2.3\%$, 95% confidence interval (CI) -0.23; 4.82) or lymphatic clearance ($\beta=8\%$, CI -13; 30).

Participants experienced a lower symptom-burden after HBOT but not an objectively measured reduction of limb volume or improvement of lymphatic clearance.

LIPOEDEMA MANAGEMENT I

Tobias Bertsch: Paradigm shift in Lipoedema and New International Consensus Document on Lipoedema

Lipoedema is associated with numerous myths!

Many of these myths have been debunked in recent years. For instance, we now know that lipoedema is not an "edema disease". We also know that pure lipoedema is not a disease of the lymphatic vessels. This paradigm shift also has consequences for the treatment of our patients. If no edema can be detected in lipoedema, decongestion also makes no sense. Instead, we should focus on the actual suffering of our patients – which is pain in the soft tissue, psychological issues, weight gain (mostly obesity) and a lack of self-acceptance because of the current beauty ideal.

This paradigm shift led to an 'International Consensus on Lipoedema', which was published in 2020. This consensus is now supported and disseminated by opinion leaders from 15 European countries as well as from well-known experts beyond Europe.

The therapy concept recommended in the International Consensus Document affects all aspects described and is presented in the lecture together with the scientific principles.

Gabriele Erbacher: Psycho-social aspects of lipoedema

Introduction: Psychosocial aspects play an important role in the disease lipoedema. However, previous surveys gave the impression that the psychological suffering of women with lipoedema was mainly caused by lipoedema.

Aims of study: The present exploratory study on the role of the psyche in lipoedema and pain is the first so far to investigate the psychological stress in the period before the development of pain symptoms typical for lipoedema.

Methods 150 patients with medically confirmed diagnosis of lipoedema syndrome were questioned in semi-structured interviews about psychological stress and were and examined for mental disorders according to ICD-10 criteria. The development of the symptoms typical for lipoedema was recorded in a second interview. Both interviews were blended together in collaboration with the patients, this means lipoedema-associated pain and psychological stress were related to time.

Results: Exactly 80 % of the patients diagnosed with lipoedema show a high level of psychological distress immediately before the onset of lipoedema-associated symptoms! In this study, mental distress was defined as the presence of a manifest mental disorder (ICD 10 F diagnosis) such as depression, eating disorder or post-traumatic stress disorder and/or serious psychological distress such as burnout syndrome or chronic stress.

Robert Damstra: Lipoedema and pain

Pain is one of the mandatory symptoms in lipoedema. Studies show that there is no relation between the severity of pain and the extent of lipoedema. The question raises what is the cause of the pain, what are patho-physiological concepts and how to influence this major complain.

The origin of pain is divided in three types of origin: Noceptive – neurophatic – central sensitization. These three types are highlighted. In lipoedema central sensitization plays a causative role in the pain perception of patients. To diagnose this further, a dedicated questionnaire is available as the Central Sensitization Inventory (CSI).

Therefore, in a multidisciplinary approach to diagnose and treat lipoedema based on the bio-psycho-social model (ICF) we advise to include a dedicated pain program in the diagnostic and finally the treatment phase as well.

Sandro Michelini: Lipoedema: A genetic disease to know better

The discovery of the first gene (AKR1C1) responsible, if mutated, of Lipedema (from the Greek word 'oedema' which means swelling and no 'accumulation of fluids'), has definitively removed the doubts on the genesis of the pathology of 'pure Lipedema', that is, of the clinical picture that does not present overlaps with obesity or other secondary comorbidities to the disease. The BMI in most of these pictures is normal and it is also possible to observe cases of women at the limits of anorexia for fear of increasing the volume of the affected areas and the pain that accompanies this.

Speaking of pain, there are those who argue that there is a mental disorder at the base. In our experience, pain is an integral part of the initial clinical picture in most cases. Mental disorder is a consequence of clinical distress. The same first enzyme discovered to be responsible for Lipedema, if mutated, is unable to catabolize Pregnanolone, a neurosteroid that has an analgesic effect by increasing GABAA currents. It is no coincidence that the three mutated familial cases described in the article illustrating the discovery did not present pain.

It is necessary to investigate all these aspects in order to better define the pathogenesis of the disease, not linked to behavioral disturbances on the part of the patients but to familiarity with genetic transmissivity.

APPROACHES TO MANAGING GENITAL OEDEMA

Rhian Noble-Jones: Presentation of results from new report and new film

Delayed diagnosis and poor treatment of genital oedema has been described by patients and lymphoedema specialists, suggesting that health professionals may have education needs on this subject. We explored this need in an international survey in 2019, followed by in depth discussions in focus groups. This presentation will share results from this study and describe what happened next... how the finding was used to produce education and information resources for health professionals and patients (e.g. films available on ILF websites) and what will happen next.

Kristiana Gordon: Genital lymphoedema: diagnostic and management considerations

Genital lymphoedema occurs as a result of damage to the lymphatic nodes and/or vessels responsible for draining the inguinal and genital tissues (secondary lymphoedema). Whilst the commonest worldwide cause of genital lymphoedema is filariasis, other causes include malignancy and its treatment, recurrent genital cellulitis, and anogenital granulomatosis. Alternatively, genital lymphoedema may develop as a result of primary lymphoedema.

This presentation provides an overview of the different causes of genital lymphoedema. It is vital to differentiate between the various forms, in order to create a bespoke management plan. In addition to standard decongestive lymphatic therapy, patients may require other treatments dependent upon the underlying cause e.g. antibiotics, systemic immunosuppression, and surgery can be offered in many cases for symptom control and debulking of debilitating lymphoedematous tissue.

S.R. Narahari: Approaches to managing genital oedema: The Indian perspective

Introduction:

Lymphatic Filariasis (LF) is the major cause of secondary lymphoedema worldwide. The integrative medicine treatment includes components of traditional Indian medicine called ayurveda, and yoga exercises, alongside allopathic drugs and compression therapy.

The lecture analyses the outcomes in 1570 patients treated during 2010-2019.

Methods:

The treatment components were water wash, soaking in a herbal solution, yoga and Indian manual lymph drainage using a herbal oil, compression therapy using long stretch bandages, bacterial entry point care using modern dermatology drugs, and a detailed counselling session lasting 30 minutes.

Results:

1146 (73%) patients attended the follow-ups. The mean percentage volume reduction at discharge was 17.39% to 30.54%. Statistically significant results were observed in volumes, quality of life, bacterial entry lesions and cellulitis episodes during the follow-ups.

Discussion:

Dramatic outcomes showed in the clinic, and community-based studies are indicators for sure success and reflected in the statistical analysis.

PLENARY IV: DILEMMAS ON COMPRESSION

Pinar Borman: Bandaging of genital lymphoedema

Genital lymphedema can be caused by primary or secondary lymphedema and commonly seen in males. Although it is a rare condition, it impairs quality of life. Compression therapies including genital bandaging and pressure garments are the mainstay of the management, in order to reduce edema and prevent complications. Precautions should always be considered according to the indications and contraindications of bandaging.

After manual lymphatic drainage, the genital organs are wrapped with special bandaging materials according to the involvement of penis and/or scrotum in males. Special consideration must be given to bandaging technique and applied materials to prevent the tendency of skin erosion. Foam padding is generally needed to protect skin and create better adherence. In females, specially shaped foam within a stockinette, or chip bags or flat-foam pads can be applied for labial and/or suprapubic bandaging.

In conclusion, the bandaging of genital lymphedema is challenging due to the anatomical characteristics, as well as to intimacy of patients and the reluctance, lack of knowledge/skills of the therapists. Therefore, education on bandaging of genitalia should be encouraged in order to develop knowledge and skills and to overcome barriers among both patients and health-professionals.

Christine Moffatt: An international study to explore the challenges faced by the medical device industry in the development and reimbursement of compression therapy

Background: Lack of agreement over the international classification of compression therapy contributes to confusion over what measures are required to capture the patient-reported and cost-effective outcome of compression therapy for this heterogeneous population. The medical device industry who manufactures compression have important insights into these issues that has not been previously explored. This knowledge could provide clarity for improving the development and use of outcome measures internationally and thus improve access and uptake of compression.

Methods: Eight medical device companies who produce compression therapy and have expertise in reimbursement took part in 11 individual semi-structured interviews to explore these issues. Data was analyzed using Interpretative Phenomenological Analysis (IPA).

Results: Five superordinate categories emerged : no definition – status quo, an ageing population, an evidence-based health care, changing international markets and patients as consumers, these were underpinned by 13 themes: 1) technical versus clinical descriptions of compression, 2) generic compression, 3) knowledge deficit throughout the system, 4) lack of evidence, 5) expanding health care pressures, 6) increased patient complexity, 7) health care systems, 8) inequality in healthcare 9) beliefs and myths about compression, 10) lack of incentive for investment, 11) reimbursement barriers, 12) burden of patient cost, 13) increased choice and direct purchase.

Conclusions: Reliance on technical definitions of compression rather than clinical descriptions lead to inertia in the uptake of compression therapy in clinical practice and barriers to reimbursement. The medical device industry adopts national strategies for obtaining reimbursement as the requirements for each country differ so much. A range of outcome measures are urgently required.

Isabelle Quéré: Compression and peripheral arterial disease

Compression therapy is highly effective in the treatment as well as in the prevention of leg

edema. However its use in patients with peripheral arterial disease (PAD) is debated. The effect of compression on blood flow in normal subjects and patients with PAD and the benefit/risk of compression applied in such patients will be discussed.

Andrea Cheville: Compression in end of life and advanced disease

Comfortable and effective compression offers tremendous benefit to patients at the end of life. Decongestive therapy provides positive effects in multiple domains including comfort, function, psychological well-being and intimacy. Conventional approaches to compression must generally be modified for palliative patients since edema is frequently multi-factorial and dynamic at the end of life which may render compression garments limitedly feasible or effective. This presentation will outline candidate approaches and review the clinical characteristics which indicate a need to trial them. Increased use of foam, Artiflex®, and other padding materials may be necessary. Reduced duration of compression and frequent removal of bandages may be required in the setting of neuropathy, dermal compromise, and arterial insufficiency. Compression wrapping may

require altered distribution, materials, and duration. The potential to exacerbate pain, dyspnea, or other adverse symptoms is also an important consideration.

Tobias Bertsch: Concensus on compression of lipoedema

Compression therapy has always been and remains an important element of best practice in the treatment of patients with lipoedema. Nevertheless, the change in the pathophysiological view of lipoedema alters the indication for wearing compression stockings. The basis for prescribing compression therapy is no longer the oedema, but rather the frequently demonstrated anti-inflammatory effects it has on the subcutaneous tissue. Studies in phlebology and sports medicine have shown that compression has a remarkable effect on the inflammatory processes in subcutaneous tissue.

However, no data are available on the anti-inflammatory effects of compression in lipoedema.

There is much to be said regarding the effects of compression as synergistic with the effects of active movement. Both these therapeutic options have an anti-inflammatory effect and a positive impact on the tissue hypoxia.

Conveying this information to the patient is a key task in the health professional-patient communication.

Besides providing symptomatic relief, compression also supports the soft tissues, reduces the mechanical impairment of movement from skin lobes rubbing against each other and improves mobility.

Aesthetic criteria with respect to the quality, color and pattern of the material, as well

as the contouring effects of the compression, can also increase patient compliance and enhance social participation.

Gabriele Erbacher: Improving compliance in compression

Compression therapy plays an important role in the treatment of lymphatic diseases, venous diseases and lipoedema. Therefore, it is of great interest to know the key factors that contribute to a good compliance as well as the obstacles.

Studies demonstrate some main reasons for noncompliance in compression: pain and discomfort, lack of knowledge and understanding the underlying disease, patients believe that compression is ineffective, psychological issues and costs, but also poor communication with the health care professional (HCP).

To improve compliance in compression it helps the HCP to understand the "maths of motivation": different patterns of goal importance and self-efficacy need to be addressed differently. This lecture offers some practical examples how to use systemic resourceful communication and motivational interviewing.

CHILDREN WITH LYMPHOEDEMA

Kristiana Gordon: The St George's Classification Algorithm of Primary Lymphoedema

Primary lymphoedema occurs as a result of a genetic predisposition causing the lymphatic system to fail to develop and/or function normally. A patient with primary lymphoedema may only have problems with swelling, but some forms of primary lymphoedema occur in association with other health problems e.g. congenital heart disease, systemic/internal lymphatic abnormalities.

Primary lymphoedema is not one disease, but the presenting feature of several distinct clinical entities. Our experience and research has led us to realise that primary lymphoedema can be divided into five different categories. Causal gene mistakes have been identified for a number of disease subtypes within the five categories. We have developed a colour-coded diagnostic pathway that describes specific primary lymphoedema phenotypes and guides the clinician on gene tests that may be available for their patient, and when to screen for associated health problems - an update.

Isabelle Quéré: Managing children with lymphoedema

Primary lymphoedema (PLE) results from abnormal development and/or functioning of the lymphatic system, can be present in isolation or as part of a syndrome, at birth, around adolescence or later in life.

Mutations are identified in children and young adults with primary lymphoedema. They impact the management of children with Lymphoedema and offer new therapeutic options.

Karl Hocking: Helping children live well with lymphoedema

Lymphoedema is often classified as a chronic condition that requires lifelong, time-consuming management. Symptoms associated with lymphoedema can have significant effects on development, physical, psychological, and social well-being, having a profound effect on daily life, body, image and self-esteem. As an occupational therapist and Children and Young People Lymphoedema Lead, I would like to challenge and explore opportunities where all health professionals, education settings and parents/carers are aware that we can enable children to live well with lymphoedema.

The journey starts with early identification and diagnosis which can only be achieved through education and raising awareness. Approaches and methods such as inclusivity, adaptation, education, innovation and motivation should be implemented along with the aim of empowering, accepting, enabling and collaborating as part of a team. These are fundamental to providing an environment for children to flourish and fulfil their potential.

OUTCOME MEASURES

Miika Vikkula: Genetics of lymphoedema: An update

Primary lymphedema can be present at birth, or develop in childhood or later in life. Thus, it may be a developmental disorder and/or due to a dysfunction of lymphatic vessels that develops with time. Since the discovery in 2009 of the first gene mutated in primary congenital lymphedema or Milroy's disease, the VEGFR3 gene, mutations in numerous genes involved in the initial formation of lymphatic vessels (including valves), in the growth and expansion of the lymphatic system and in associated pathways have been identified in syndromic and non-syndromic forms of PLE. Thus, the current hypothesis is that the majority of cases of PLE has a genetic origin, although a causative mutation can be identified in only about one-third of affected individuals. Overall, three patterns of inheritance are observed, including autosomal dominant (including de novo mutations), autosomal recessive and X-linked. Moreover, penetrance is often less than 100%, making identification of mutations more difficult. Most mutations cause loss-of-function, although some, such as in the genes associated with Noonan syndrome, gain-of-function. Various functional pathways seem to be involved.

Vibeke Hjortdal: Lymphatic dysfunction in Congenital Heart Disease.

Patients with specific types of congenital heart disease develop long-term complications that are thought to be related to abnormal lymphatic function. The clinical manifestations are protein losing enteropathy, plastic bronchitis, chylo-and hydrothorax, ascites and edema.

Using non contrast MR and Near Infrared Fluorescent Imaging techniques we have evaluated the lymphatic morphology and function in health as well as in patients with specific congenital heart defects where the lymphatic function is challenged by elevated central venous pressures.

The activity of the lymphatic vascular propulsion of fluid back to the blood circulation was quantitated in terms of lymphatic vascular contraction rate, velocity and pressure generated in the lymphatic vessels.

The patients with congenital heart disease disclosed increased rate of contraction until a certain level of complication after which they seem to be exhausted. Using a heat stress test, the reserve capacity was also found to be diminished.

Joanne Cooper: Using the ILF wound COM in a skin integrity model in Nottingham, UK

Introduction:

Nottingham University Hospitals NHS Trust is committed to delivering an integrated pathway for patients facing challenges to their skin integrity, including all forms of wounds.

Aim: This paper presents a summary of work to develop a Strategic Plan for Skin Integrity founded on partnership and co-development with the ILF partners and based on the ILF wound COM.

Methods: The work adopted the principles and practices recommended in the Change Management Theory ⁽¹⁾ 1) situation analysis 2) production of a strategy 3) identifying understanding assumptions. Data was captured using Logic Models informing a Theory of Change model of care⁽²⁾.

Results: Three overlapping strands were identified: 1) service configuration, 2) data and documentation and 3) education.

Conclusions: An effective skin integrity strategy for NUH and its partner organisations is essential for delivering excellence in care outcomes. Using a Theory of Change approach provides clarity on key steps required for implementation.

Wouter Hoelen: International Classification of Functioning (ICF) core set lymphoedema, what's next?

Introduction: As a physiotherapist, you must be able to classify the condition of a patient according to the diagnosis of health in relation with levels of body functions and structures, activities and participation as well as taking a patients psychosocial and environmental circumstances in consideration. In daily practice every single patient is classified and coded using the International Classification of Function. As an oedema physiotherapist we were introduced to the ICF core set for lymphoedema at the ILF conference several years ago.

Objectives: This presentation will give an overview of the ICF core sets of lymphoedema and its practicality using patients journey's. This presentation is a call for a multi-country data analysis using the ICF core set of lymphoedema coding system regarding participation. This might provide insight for a better understanding and explaining of the economic and social burden of lymphoedema (Qualys and Dalys)

Martina Sykorova: ILF Outcome Measures Project (ILF-COM)

There is a lack of agreement on treatment outcomes for chronic oedema (CO) and lymphoedema. The International Lymphoedema Framework is undertaking a project to understand this disharmony. The ILF-COM project consists of a survey, scoping review, and qualitative study.

An international survey was developed and deployed through Survey Monkey and social media to understand how CO outcome measures are viewed. A total of 8014 respondents from 61 countries participated including clinicians, patients, and industry representatives. The survey findings show that outcome measures are not well understood or consistently used in the treatment of CO and lymphoedema.

To develop a deeper understanding of the issue, the ILF-COM project also consists of a scoping review that aims to map current outcome measures used for CO and lymphoedema in adult and children patients used in healthcare settings. A comprehensive search using several databases found 7818 studies meeting the eligibility criteria.

Ellie Dring: Validation of the ILF wound COM in the UK

Introduction

NHS England (HEE), recommend the use of the minimum data set in wound assessment. The LIMPRINT study identified the strong association between wounds and chronic oedema

Aims of study

The HEE minimum data set was evaluated, to determine its usability.

Methods

A Multi-methods approach included a survey and a wound assessment audit developed with the ILF, the Copenhagen Wound Care Center and NUH Tissue Viability Team.

Results

The findings of the survey indicated that nurses' value standardised wound care education and training; access to evidence based treatment guidelines and products; and realistic wound care plans.

40 participants with wounds were audited; this identified that the data set lacked specificity, adequate baseline information; escalation to specialists; and required further information on chronic oedema, pain, quality of life and discharge plans.

Conclusion

The results of the study led to the amendment hospital wound assessment document, and a clinical research project will be evaluated in a partner project, in Denmark.

INDOCYANINE GREEN (ICG) FLUOROSCOPY

Jean-Paul Belgrado: ICG - Near-Infrared Fluorescence Lymphatic Imaging

Indocyanine green (ICG), a fluorescent contrast agent, complements the collection of lymphatic imaging tools to study lymphedema and the superficial lymphatic system. The technique, providing dynamic images, is minimally invasive, low cost, and repeatable. Small quantities (0.08 mg) of diluted ICG (0.4ml) is injected intradermally.

To obtain rich images with plentiful collectors, it is essential to 'fill' the collectors through applying the 'Fill and Flush' MLD technique for 10 minutes after injection. Comparing normal and lymphoedematous images, NIRFLI characterizes the architecture of the superficial lymphatic network and demonstrates specific patterns which provide valuable information to characterise lymphedema.

NIRFLI has many applications, including screening; detecting the earliest failure of secondary lymphedema; Mapping; assessing lymphangion motricity, valvular continence, pumping forces and demonstrating substitution pathways, and reflux to the genitalia. Used during surgery it helps to identify and protect functional lymphatic collectors. NIRFLI also provide an efficient tool to study lympho-venous anastomosis.

Cheryl Pike: Using ICG scanning in supporting Lymphoedema Management

Indocyanine green (ICG) fluoroscopy is more commonly used to identify suitable lymphatics for Lympho-Venous Anastomosis (LVA) surgery. It is also used to inform drainage pathways for Manual Lymphatic Drainage (FG-MLD). However, what happens to a patient who has attended a clinic hoping to be suitable for LVA surgery and its potential life-changing benefits, when their lymphatic damage proves too much to be suitable for surgery? This session aims to demonstrate how ICG fluoroscopy can inform more innovative ways of self-management, advise lymphoedema therapists of potential beneficial intensive treatment options to utilise with the patient, and the outcomes seen in practice. Furthermore, the use of ICG fluoroscopy has challenged previous MLD routines, and has seen the reintroduction of movement within the Casley-Smith MLD programme.

Melanie Thomas: ICG scanning: The gateway for Lymphatic Venous Anastomosis

Since 2015, Lymphoedema Network Wales clinicians have been involved in the scanning of patients to establish their suitability for LVA surgery. A Patient Group Directive (PGD) was created to provide governance for Nurses and Physiotherapists to administer the dye and scan patients effectively. This session will present the process surrounding ICG scanning as well as the data on 150 patients who were scanned and have subsequently received LVA surgery. The data has demonstrated important benefits post-surgery in reduction in pain, heaviness, cellulitis episodes as well as improved patients reported outcomes. The health economic argument of LVA surgery will also be presented.

PATIENT SESSION I

Jørgen Rungby: Lipoedema from an endocrinological point of view

Adipose tissue secretes a multitude of hormones and other signal substances. Further, adipose tissue itself is responsive to many hormones. Adipocytes, macrophages and fibroblasts in lipoedema differ from other cells in other adipose tissues, both abdominal and peripheral, in a number of ways. The lecture will explore both these differences and the relationship between systemic hormones and the development – and possibly treatment – of lipoedema. Clinical experiences from an endocrinologist's perspective, focusing on possible treatments aiming at reducing fat mass, inflammation and fibrosis, will be presented.

Ewa Burian: Cellulitis data from LIMPRINT

Cellulitis is a common and potentially serious bacterial infection of the skin, often leading to hospitalization, long-term morbidity and recurrent disease. It has been reported to account for over 1% of the emergency admissions, and is regarded as one of the leading causes of potentially preventable hospitalizations. Chronic oedema has previously been known to be a predisposing factor for cellulitis, but the number of studies designed to investigate this relationship have been few. In this talk, Dr. Burian will present the cellulitis data from the LIMPRINT study, including 7477 patients with clinically assessed chronic leg oedema. What is the extent of the problem of cellulitis in chronic oedema on an international level? What risk factors for cellulitis were identified? And how can we prevent it? These questions will be answered, including a hypothesis of why swelling of the legs predispose to the development of cellulitis.

Pernille Henriksen: Infections; the experiences, the fear and the solutions from a patient point of view

Many patients with lymphoedema have a real fear of cellulitis. Not just because of the painful ordeal and the potential aggravation of the lymphoedema. But also because they are often met with a lack of knowledge on the subject by the health care professionals they meet when they need urgent treatment. Pernille Henriksen, who has primary lymphoedema since her late teenage years, shares her personal journey with devastating experiences with infections. She will cover how she has learned to reduce the risks of infections and manage them better when they happen.

SELF-MANAGED CHALLENGES

Marina Cestari: Self-management & self-efficacy tools

Introduction: The rehabilitative therapeutic model has to include the self-management achieved through therapeutic education. This requires patient's adherence through an optimal communication, the evaluation of the characteristics of the patients and the respect for their latency time.

Methods: Therapeutic education includes hygienic-behavioural rules, self-assessment of oedema, skin care, body weight control, combined self-management (manual self-drainage/self bandage), management of the elastic brace, physical activity. Concerning self-efficacy tools, we use the drawing-colouring in children and photos in teenagers, in consideration of the difficulty in expressing one's emotions, based upon Rose's critical visual methodology framework and the ULL-27 questionnaire in secondary upper limb lymphoedema.

Results: The most important challenge is always to improve the patient's quality of life and development awareness of one's limits-possibilities for an optimal self-management and this was obtained in almost all patients.

Conclusions: The therapeutic-educational strategy aims to induce a greater awareness-responsibility of the patients for the management of their pathology.

Jan Douglass: Lymphoedema self-care in resource poor settings - challenges for people affected by filariasis- and podoconiosis-related lymphoedema in rural Bangladesh and Ethiopia

Lymphoedema from lymphatic filariasis (LF) and podoconiosis causes disfigurement, disability, stigma, and social exclusion for over 20 million people globally. The WHO recommends a community-based home-care model of service delivery where the focus is on hygiene aspects of lymphoedema management to reduce the frequency and severity of acute secondary infections. We conducted randomised controlled trials among people affected by moderate and severe lymphoedema in Bangladesh and Ethiopia and showed the benefits of adding deep breathing and lymphatic massage to the daily self-care regime. This presentation will describe how the lymphoedema self-care training was delivered and discuss the challenges inherent in the geographical and political setting in each country. Lifelong daily self-care must be at the heart of sustainable and person-focused service delivery for people living with lymphoedema, and lessons from low- and middle-income countries have the potential to cross disease and geographic boundaries to inform us in self-care for everyone.

Ellen Collard: View on living with primary lymphoedema and managing compression

Self-management of lymphoedema comes with preparation, patience and perseverance. Compression is one of the main aspects of lymphoedema therapy, for Ellen this was life changing in managing her condition. However, this was not without challenges. Ellen shares her own perspective on the trials and tribulations of self-management of lymphoedema and compression

Alison Edgley: Teaching and learning self-management: findings from an ethnography of a lymphoedema summer camp

We examine the findings from qualitative ethnographic data collected during a three-day educational lymphedema camp on self-management for families with a child with lymphedema.

Observational and interview data were collected from parents and professionals. The emotional nature of the reported experience found in both parents and professionals became our analytic focus. Distress, doubt, fear, loneliness, guilt, and moralism were expressed for a range of reasons by both parents and professionals.

By making embodiment our analytic focus we took seriously the feelings that derive from the uncertainties, inconsistencies and tensions that result from the varied interpretations of self-management both within a family and between practitioners and families. Rather than identifying problems in self-management as an absence of readiness in individual families the findings from this paper point to the systemic problem of self-management becoming best practice where support and resources for how to achieve it in this complex population are absent.

PUBLIC SYSTEMS OF CARE AND PATIENT ENGAGEMENT

Sandro Michelini: The achievements and lessons learned from conducting LIMPRINT in Italy

On September 15, 2016 in Italy, the Minister of Health, also at the request of the ITALF, published the guidelines in favor of Lymphedema patients. Primary lymphedema was finally considered a rare disease and the secondary one was protected with adequate health care with specific codes.

In the same period the LIMPRINT ITALIA study began which allowed us, based on the analysis of the numbers, to orient our institutional interventions on the correction of the deficiencies found in the territory. In this sense, after the completion of the study, reference structures have been opened in several Italian Regions, with the possibility of assistance in Day Hospital and in Hospitalization for the most serious cases, in need of clinical assistance within 24 hours, or characterized by 'intransportability' or 'social fragility'. Many territorial outpatient centers have also been opened and training courses for operators have multiplied.

There is still a lot to do but, certainly, on the basis of what has been achieved and with the indications that have also emerged from the LIMPRINT study, especially concerning some epidemiological data, important for the definition of assistance, today it can be said that in Italy the patient with lymphedema certainly enjoys assistance from the public health system above the average of other countries.

Pinar Borman: Therapeutic education

Complex decongestive therapy (CDT) is the recommended treatment which consists of intensive and long-term management phases. The education of the patient about skin care, exercises, weight control and self-management techniques are the mainstay of the management in both phases. As the lymphedematous extremity has significantly increased risk for infection, skin care is vital for both prevention and treatment of lymphoedema. Patients with lymphedema should also be advised to avoid weight-gain. The education and initiation of a tailored and graduated strength training exercises improve signs and symptoms of lymphedema in both therapeutic and maintenance phases. Because the most important factor to maintain the effect of phase 1 therapy is the use of compression garments; education on compression garments is important for compliance and adherence. Education on self-MLD and self-bandaging are recommended in both active and the maintenance phases.

In conclusion therapeutic education on skin care, weight control, pressure garments, self-MLD, self-bandaging and exercises are very important in both phases of CDT and should be considered in order to control and self-manage the chronic pathology, increase compliance and maintain long-term motivation in patients with lymphedema.

LIPOEDEMA MANAGEMENT II

Melanie Thomas: Value Based Lymphoedema Healthcare and the creation of LYMPROM (Patient Reported Outcome Measures)

Lymphoedema Network Wales commenced in 2011 and each year receives around 6,000 new patient referrals. With rising demand and limited capacity a new way of thinking was established to understand what is really important to our patients. Value-Based Healthcare promotes quality and outcomes over costs. Thus, to understand the whole-life impact of Lymphoedema from our patients a new Patient Reported Outcome Measure- LYMPROM was devised. The aim of LYMPROM is to drive quality and efficiency, guide care and support services to manage their caseloads; helping to deliver the Value-Based Health Care. Over 5,000 LYMPROMs have been received digitally from three Lymphoedema Services in Wales in the last year. This information has enabled patient-centre care covering a diverse range of areas including shopping for clothes/shoes, body image, and intimacy/desirability. This initiative is supporting strategic working in identifying patients who can be safely discharged and prioritising in-person contacts.

Isabel Forner-Cordero: Phenotypes of Lipoedema

Lipoedema is a chronic disease very frequent in the female population. It has been reported a prevalence of 11% but it is potentially higher considering the frequent underdiagnosis and the misdiagnosis with obesity or lymphedema. One of the major problems is the lack of a test to confirm it.

Diagnosis of lipoedema is mainly based on clinical history and physical examination.

The most characteristic manifestations of lipoedema are: easy bruising, the disproportion between the upper and lower body-halves, symmetrical involvement of the lower limbs and unaffected feet.

Lipoedema can be classified in 5 types depending on the distribution of fat; and based on inspection and palpation, lipoedema can be classified in 4 clinical stages of severity. As obesity is the most frequent comorbidity in patients with lipoedema, the differential diagnosis is not always easy to do and the relationship between both diseases has to be deeply addressed in the future.

Jørgen Rungby: Lipoedema from an endocrinological point of view

Adipose tissue secretes a multitude of hormones and other signal substances. Further, adipose tissue itself is responsive to many hormones. Adipocytes, macrophages and fibroblasts in lipoedema differ from other cells in other adipose tissues, both abdominal and peripheral, in a number of ways. The lecture will explore both these differences and the relationship between systemic hormones and the development – and possibly treatment – of lipoedema. Clinical experiences from an endocrinologist's perspective, focusing on possible treatments aiming at reducing fat mass, inflammation and fibrosis, will be presented.

Ad Hendrickx: Physio- and movement therapy for the lipoedema patient

The publication of the "European Best Practice of Lipedema" has been an important step in both the diagnostic and therapeutic approach of lipedema. An individual tailored therapy plan is set up, based on the patients' specific complaints and personal goals. Questionnaires and physical tests are chosen to objectify the patient's story and the results form the basis of the so called 'health profile'. Both diagnosis and health profile are leading for the therapy plan. It is essential that patients understand that lipedema is a chronic disease that can be negatively impacted by increasing body weight, a lack of physical activity, inadequate illness believes and distress. The therapy will consist of combinations of physio/movement-, compression-, psycho-social therapy, education, and weight management. A treatment plan based on the concept of Graded Activity is advised. Self-management is the connecting key element between all therapy components.

Nestor Torio-Padron: Consensus of the European lipoedema forum: Liposuction for the treatment of lipoedema, yes, but...

Introduction: Many doctors who offer liposuction to treat lipoedema propagate, that "this surgical procedure leads to comprehensive and long-term improvement of lipoedema".

Aim: We have been able to show that there is a considerable gap between these euphoric promises made by surgeons, and the current findings on liposuction. There is no doubt that in those cases a financial conflict of interest may exist. There are deficits in the quality and settings of many studies about this issue, deficits which lead to doubt with regards to these statements.

Method: For this reason, the senior author of this abstract organized the 1st and 2nd European Lipoedema Forum and invited renowned lipoedema experts from different European countries to discuss on this subject with the goal to establish a consensus about the treatment options in cases of lipoedema.

Conclusions: All experts of the European Lipoedema Forum agreed that liposuction can lead to an improvement in a patient's lipoedema, but the correct selection of patients according to medical criteria is the decisive factor for therapeutic success. The main contraindication for liposuction exists in patients simultaneously presenting with severe obesity and lipoedema. Liposuction is definitively not a method to be used for treating obesity.

Jodok Fink: Impact of bariatric surgery on Lipoedema

Objective

To analyze leg volume and weight-loss in lipoedema patients following bariatric surgery.

Summary Background Data

Lipoedema is clinically characterized as subcutaneous lipohypertrophy in association with soft tissue pain affecting female patients. Recently, the disease has undergone a paradigm shift departing from historic reiterations of defining lipoedema in terms of classic edema paired with the notion of weight-loss resistant leg volume towards an evidence based, patient centered approach. Although lipoedema is strongly associated with obesity, the effect of bariatric surgery on leg volume in lipoedema patients has not been explored.

Methods

In a retrospective cohort study, thigh volume and weight-loss of 31 patients with lipoedema were analyzed before, 12 and >24 months following Sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB). Patients with distal leg lymphoedema (healthy thigh) that had undergone bariatric surgery served as controls. Statistical analysis was performed using a linear mixed effects model adjusted for patient age and initial BMI (excess BMI loss for analysis of thigh volume reduction).

Results

Adjusted initial thigh volume in patients with lipoedema was 23785,361 ml (CI 22316.6-25254.1). Leg volumes significantly decreased in lipoedema and control patients (Baseline vs. 1st P<0.0001 and P=0.0001; 2nd follow-up P<0.0001 and P=0.0013, resp.). Adjusted thigh volume reduction amounted to 33.4% in lipoedema and 37.0 % in control group at first and 30.4% and 34.7% at 2nd follow-up (lipoedema vs. control P>0.999 for both). SG and RYGB led to equal reduction of leg volume (operation × time P=0.83). Furthermore, volume reduction was equally effective for obese and super-obese patients (weight category × time P=0.43).

Conclusions

SG and RYGB lead to a significant thigh volume reduction in patients with lipoedema.

PATIENT SESSION II

Rhian Noble-Jones: Exercise and Movement

Over the last 18 months the Covid pandemic has caused many of us to think differently about our health services and how we care for our own health when health services are struggling. Lymphoedema and exercise has more good quality research happening now than ever before but it can still be difficult to bring it into your own daily routines. In this session we'll be thinking about this time as a period for a 'fresh start', to explore what is safe, what's important and what has stopped us in the past. The session also incorporates some advice regarding the different approach to exercise required for those affected with long-Covid.

Karen Morgan: Compression and me!

Compression Garments are the mainstay treatment for lymphoedema and chronic oedema however, what is the real impact on people who have to wear them? Do we as clinicians and therapists really understand the impact and burden of wearing compression?

This session will discuss the importance of choices and explore as clinicians that we do not always get the compression right for everyone at the first, second or even the third attempt.

We need to truly listen to you, work with you discuss the risks and benefits and enable you to make an informed decision about wearing the compression that works best for you.

What fits into your lifestyle, tricks and tips for layering compression garments, wearing them at night, going down a size, other alternatives and discussing choices for days when you feel unable to wear compression garments at all. Empowering and supporting you to feel in control.

Ellen Collard: My compression story

Self-management of lymphoedema comes with preparation, patience and perseverance. Compression is one of the main aspects of lymphoedema therapy, for Ellen this was life changing in managing her condition. However, this was not without challenges. Ellen shares her own perspective on the trials and tribulations of self-management of lymphoedema and compression.

Cheryl Pike: Skin care and massage

The importance of a regular skin care routine cannot be emphasised enough when you have lymphoedema. It is the foundation for good skin health in preventing infections such as cellulitis (erysipelas) and wounds (ulcers). However, when applying an emollient such as a cream or ointment, did you know that you are actually doing a form of self-massage? This session will introduce you to a new way of thinking about your skin care routine, and how you can build on the massage skills you already have so that you can soften those harder/firmer areas of lymphoedema. We will demonstrate how the use of simple gadgets has the potential to revolutionise your lymphoedema self-management so that you can see the improvement immediately; whether it is getting to those hard to reach areas, or seeing a visible reduction in your swelling after 5 minutes of massage.

Karl Hocking: The biggest barrier to self-management is me!

We are all aware that Lymphoedema, especially within the children and young people population, is a chronic condition that requires ongoing self-management. This can be burdensome upon the child, parents/carers and siblings. The daily management of lymphoedema can be daunting, so I ask, "does every day need to be a therapy day?" or are there everyday activities that can be incorporated for therapeutic benefit?

The most important aspect for someone to self-manage their condition is to understand it and work collaboratively with the health professional to provide a toolbox of strategies that the patient and family are able to understand why and how to perform them. To align techniques into everyday behaviours with support from lymphoedema specialists who aim to empower, enable, adapt so that the patient can recognise that daily activities, such as, play, making food, dressing, self-care and activity can all form part of self-management routines.

Melanie Thomas: Taking control in my lymphoedema appointment

How many times have you attended a lymphoedema appointment and thought I wish I had asked that or didn't feel that you got your biggest concerns to be heard by your health care professional?

This session will provide patients with some tips and hints to take control of your lymphoedema appointment. Completing a Patient Reported Outcome Measure such as 'LYMPROM' and writing down what is valuable and important to you may be a great start. In Wales we have commenced asking our patients to complete 'LYMPROM' two weeks prior to their appointment so that we can understand what the biggest issue is. A free text box also allows patients to document what they want to say. In the last year we have received nearly 5,000 'LYMPROMS' which has enabled patients to document what is important to them.

KRÆFTSÅR OG ANDRE SPECIFIKKE SÅR (IN DANISH)

Betina Lund-Nielsen: Kræftsår – pleje og behandling

Forskning indenfor pleje og behandling af mennesker med kræftsår er fortsat et overset område. Revolutionerende nyheder indenfor dette emne er derfor sjældent forekommende. Et spirende område er dog pallierende behandling med elektrokemoterapi samt calcium elektroporation. Effekten af disse behandlinger vil blive gennemgået.

Fakta om kræftsår samt de sårrelaterede problemstillinger vil blive belyst, og den helhedsorienterede og tværfaglige pleje og behandling af denne meget plagede gruppe af patienter vil, via cases, blive ankueliggjort.

Tove Agner: Steroidcreme, steroidbehandling af eksem og sår, hvordan bruges de i praksis?

Omkring (ben)sår opstår ofte eksem, og etiologien til dette kan være multifaktoriel. I oplægget vil udredning af årsag til eksem blive gennemgået, og behandlingsmuligheder blive diskuteret, specielt med henblik på langsigtet behandling. Fokus vil bl a være på effekt og bivirkninger af topikale steroidcremer.

Sophie Bojesen: Cancer i kroniske sår – en kasuistik

Baggrund: Malign transformation i eksempelvis kroniske sår og ar fra brandsår, kaldet Marjolin's ulcer er en sjælden og ofte overset diagnose.

Case: En 49-årig kvinde som gennem ca. 11 år er behandlet med systemiske og lokale behandlingsmodaliteter for necrobiosis lipoidica med begrænset effekt. Patienten har store, ikke helende sår anterior på begge underben, og det ene kroniske sår undergår malign transformation med udvikling af højt differentieret pladecellekarcinom. Karcinomet behandles indledningsvist kirurgisk med radikal excision. Patienten får inden for 1 år recidiv med spredning til lymfesystemet.

Konklusion: Tidlig diagnostik, aggressiv behandling og tæt opfølgning er nødvendigt i behandlingen af Marjolin's ulcer.

DIABETISKE FODSÅR (IN DANISH)

Klaus Kirketerp-Møller: Diabetiske fodsår, patofysiologi

Patofysiologien bag diabetiske fodsår er kompleks og kun delvist forstået. Den vigtigste årsag til at der opstår fodsår hos personer med diabetes er udviklingen af neuropati. Årsagerne omfatter livsstil, insulin resistens, inflammation, overvægt og lav HDL-kolesterol. Omkring 50% af alle personer med diabetes får neuropati og halvdelen af disse har ingen symptomer. Iskæmi er en anden vigtig årsag til manglende heling af fodsår hos personer med diabetes. Glykæmisk kontrol er vigtig idet 1% stigning i HbA1c korrelerer med en 28% stigning i incidensen af perifer iskæmi. Iskæmien hos personer med diabetes er blandet med en udtalt grad af småkarssygdom. Den tredje årsag til manglende heling af diabetiske fodsår skyldes infektion. Den nedsatte evne til at klare infektioner kan skyldes påvirket funktion af neutrofile granulocytter og samspillet med nedsat vævsperfusion grundet iskæmi. De fleste af følgerne der fører til fodsår er irreversible og forebyggelse er derfor særlig vigtig.

Jesper Bencke: Ganganalyse

I dette foredrag vil der blive sat fokus på objektive biomekaniske metoder til evaluering af trykbelastning under fødderne. Det vil blive gennemgået hvilke parametre, som der vil være bedst anvendelige, og hvilke biomekaniske og anatomiske faktorer som kan indvirke på disse. Der vil også blive vist eksempler på praktisk brug både i kliniske cases og i forskningsprojekter.

Thomas Bjarnsholt: Biofilm i sår

Biofilm er i stigende grad forbundet med mange kroniske infektioner. Hovedproblemet med kroniske infektioner er, at de er vanskelige at behandle. Behandlingsproblematikken tilskrives ofte at bakterier i biofilm er tolerante over for antimikrobielle stoffer og immunsystemet.

I denne præsentation vil jeg belyse de udfordringer som biofilm udgør i specielt sår infektioner, både i forhold til behandling, men også i forhold til immunsystemet. Desuden vil jeg diskutere problemerne og faldgruberne vedrørende diagnosen af disse infektioner.

Jeg vil og komme ind på hvad er en biofilm? Ved vi alle hvad vi taler om in vitro vs in vivo?

Hvilken rolle spiller det infektiøse mikromiljø for disse infektioner, og hvorfor har du som forsker og kliniker brug for at vide mere om dette?

DERMATOLOGI (IN DANISH)

Anne Vejrum Nielsen: Hudplejemidler

Fedtstoffer, konservering og allergifremkaldende stoffer er nogle af de indholdsstoffer, som kan være i de hudplejemidler, vi smører på vores hud hver dag. I oplægget om hudplejemidler, vil jeg komme omkring om de forskellige indholdsstoffer, som er i hudplejemidler og ud fra indholdet af fedtstoffer inddele dem i de forskellige slags cremer, fx fedtcreme. Oplægget vil kort komme ind på hvordan ikke medicinske cremer anvendes i behandling af fx eksem.

Bo Jørgensen: Atypiske sår

For borgeren er et sår et sår. Han skelner ikke til årsager eller diagnostik. Han vil behandles uanset om han har et tryksår, venesår eller et diabetisk fodsår – eller noget helt andet. Som sårbehandlere er vores opgave mere differentieret – vi bør kende til alle sårtyper, og deres behandling, hvis vi skal lykkes.

Med dette indlæg er formålet at pege på de meget sjældne sår. De sår som kan kræve en speciel behandling. Eller de typiske sår – der imidlertid ikke fremtræder typisk.

Martorells sår, Marjolin's sår, Ectyma, Sår som følge af anden behandling, Pyoderma gangraenosum Leishmaniasis, Pilonidalcyste eller Nekrotiserende bløddelsinfektion, visse cancertyper er eksempler her på.

Den diversitet er udfordrende, men i respekt for vores fag bør vi også kunne behandle de "atypiske" sår.

Hanne Faarup: Hudpleje, syg og rask hud

Huden er et fantastisk, men ofte overset, organ.

Kom og få viden om, hvad der er vigtigt at observere og reagere på for at medvirke til at forebygge alvorligere hudproblemer.

Hvilke redskaber har vi i værktøjskassen, hvordan og hvornår skal vi bruge dem?

Bliv klædt på til at kunne guide andre i, hvad der er vigtig for, at mennesker behandles bedst muligt for kløe, smerte og hudsult m.m.

TRYKSÅR / PRESSURE ULCERS (IN ENGLISH)

Dimitri Beeckmann: Overview of the latest update of the PU guidelines and IAD (Incontinence Associated Dermatitis)

Maintaining skin health and preventing skin barrier damage are integral components of daily nursing practise in all healthcare settings. Maintaining skin integrity is an important quality indicator that contributes to positive patient outcomes and is considered more cost effective compared to wound care. Healthy skin is strong, resilient and has a high repair capacity. However, due to ageing and altered physiology, skin integrity can be compromised in certain populations. People with increased skin vulnerability are at increased risk for a number of skin lesions, with pressure ulcers and incontinence-related dermatitis (IAD) being among the most common conditions. Depending on severity, both conditions can have a significant impact on patients' physical, social and psychological well-being. International guidelines recommend the timely application of preventive measures to successfully prevent pressure ulcers and IAD. However, there are some important knowledge gaps that limit the effectiveness of current strategies to some extent. In this context, this presentation will focus on early detection of deep tissue damage and prevention of IAD in adults.

HUDTRANSPLANTATION (IN DANISH)

Lærke Vendelbo Viggers: Transplantatpleje Vest

Hudtransplantation er et effektivt og særdeles benyttet kirurgisk værktøj til lukning af større defekter og evt. kroniske sår. Dette oplæg præsenterer teorien bag hudtransplantation, hvornår det vælges, hvad det kan bruges til, samt vores erfaringer for indpakning og behandling af hudtransplantater i Vestdanmark.

Mitra Sepehri: Transplantatpleje Øst

Gennem tiden har hudtransplantation af sårdefekter været flittigt anvendt i de kirurgiske specialer - særligt indenfor ortopæd- og plastikkirurgi.

Teknikken er simpel og som oftest sikker i den trænede kirurgs hænder. For at sikre anslag og indheling af transplantatet, er det postoperative forløb med pleje og restriktioner af yderste vigtighed. Helt centralt er adressering og håndtering af faktorer som eksudation, underminering, infektion med mere, således at den korrekte pleje bliver iværksat.

Der er typisk tale om konventionel fugtig sårpleje med produkter, såsom nitrofurantiongaze og jellonet som kontaktag, inderst og kompression yderst. VAC-behandling kan også være indiceret.

I Danmark er der regionale forskelle indenfor transplantatpleje, som vil blive belyst i præsentationerne. Disse forskelle har dog for så vidt vides ingen betydning for transplantaternes mulighed for indheling. Der er nærmere tale om kulturelle og regionale forskelligheder i disse transplantatregimer.

Michelle Mistry Igbokwe og Marianne Hass Lindahl: Forenklet bolus-bandagering på hudtransplantater - fordele

Den postoperative behandling af hudkræft er fortsat en udfordring for det danske sundhedssystem med konstante besparelser på sundhedsbudgetter. I Danmark ledes den nationale behandlingsstrategi for hudtransplantationer af et princip om fugtig/våd sårheling. Bolusforbindingen består af en paraffinimprægneret gaze (Jelonet), en antibiotisk gaze (nitrogaze) og endelig flerlagsskumforbinding til fastholdelse af transplantatet mod sårbinden. Selvom denne metode er effektiv, så opstår der alligevel en række udfordringer under indhelingen. Den vedvarende eksudation under den inflammatoriske fase øger ofte risikoen for utilstrækkelig tilhæftning, men også forskydninger af transplantatet. Ligeledes kan patienten opleve ubehag ved skift af flerlagsforbindingen, eftersom denne ofte klæber sig fast til transplantatet/sårkanter, med resulterende defekter, smerter og forsinket sårheling.

I 2018 blev afdelingen i Esbjerg introduceret til polymerbandagen som ifølge produktbeskrivelsen havde en multimodal tilgang til sårpleje, herunder transplantatpleje, i ét produkt. Vores erfaringer har vist, at produktet er enkelt at bruge, reducerer tidsforbruget og har en høj anslagsprocent.

Marie Kristine Hjort: Vækstfaktorer til at fremme sårheling

Formålet med studiet er at undersøge hvorvidt effekten af blodderiverede vækstfaktorer til behandling af kroniske sår på underextremiteten er bedre end placebo og standard behandling målt i antal patienter med komplet sårheling. Desuden er undersøgt hvorvidt der er forskel på hvilken type vækstfaktorer der behandles med herunder rekombinante, autologe og homologe vækstfaktorer.

KOMPRESSION/ØDEM (IN DANISH)

Ewa Burian: Risiko for erysipilas og sår ved kronisk ødem

Baggrund: Kronisk ødem (ødem >3 måneders varighed) er en forsømt sundhedsbyrde verdenen over, der medfører stor risiko for potentielt alvorlige komplikationer som erysipilas/rosen og sår. Selvom behandling af kronisk ødem med fx kompression har været kendt siden Hippocrates, har få studier været designet til at undersøge relationen mellem kronisk ødem og relaterede komplikationer.

Metode: I dette foredrag præsenteres data fra LIMPRINT-studiet, hvor ni lande og 40 centre deltog, med over 10 000 klinisk vurderede patienter med kronisk ødem.

Resultater: Forekomsten af erysipilas og sår er meget hyppige ved kronisk ødem på benene, med en punktprævalens på 13% af sår og en livstidsprævalens på 38% for erysipilas. Et hovedfund var at et velkontrolleret ødem, fx med kompressionsbehandling, er associeret med en halveret risiko for sår (OR 0.50, p<0.001) og erysipilas (OR 0.59, p<0.001).

Konklusion: Behandling af kronisk ødem et vigtigt for forebyggelsen af sår og erysipilas.

Jane Hampton: Projekt – at sove med kompressionsstrømper

Borgere med hævet underben bliver behandlet med multikomponent kompressionsbandager som beholdes på i op til 7 døgn. Når borgeren får en kompressionsstrømpe, fortæller sundhedspersonaler, at strømperne skal af om natten. I Aarhus Kommune undersøgt vi hvad borgere oplever hvis de beholder strømperne på om natten. En initial prøvebehandling vist at mange borgere, som beholdt strømper på i 48 timer, oplevede mindre hævelse i anklen om dagen, mindre uro i benet om natten, og følte sig mere selvstændigt.

I dag, beholder 24% borgere, som får hjælp fra hjemmeplejen, deres strømper på nogle nætter om ugen. Der laves en individuelle risikovurdering om borgeren kan beholde strømper på om natten, og hvor mange gange om ugen strømperne kommer af. Ændret praksis har resulteret i færre recidiv bensår og yderligere afvændingsbehandling.

Døgn rundt brug af kompressionsstrømper giver fordele for både borgere og sundhedsvæsen.

Annette Høgh: Arteriosclerose, neuropati og kompression

Ødem øger diffusionsvejen fra kar til celler og påvirker derfor kapillærernes mulighed for at aflevere næringsstoffer og ilt. Ødem bekæmpelse er derfor en af hjørnestene i forebyggelse af kroniske sår, men også i behandling af disse.

Iskæmi og neuropati er ikke kontraindikationer til brug af kompression. Derimod skal der tages særlige forholdsregler omkring valg af kompressionsløsninger ved sameksisterende neuropati og/eller iskæmi, for at minimere risikoen for udvikling af trykrelaterede skader/sår. Hos iskæmikere skal det tilstræbes at vælge en kompressionsform der frembringer et tilstrækkeligt højt tryk til mobilisering af ødemet, uden at den arterielle blodforsyning kompromitteres. Hos neuropatikere er polstring og ikke mindst instruktion af brugere til daglig hudinspektion af største vigtighed.

Else Sværke Henriksen: DSFS' s kompressionsguide

En kort præsentation af guiden. Hvordan blev guiden til, og hvad er tankerne bag denne?

Hvordan kan den bruges?

Er der fortsat behov for denne kompressionsguide? Hvis ja, Kan guiden udbredes yderligere til gavn for kolleger og patienter rundt i landet, sådan at færre har gener fra ødem og sår heler hurtigere?



DANISH LYMPHOEDEMA FRAMEWORK (DLF) DANSK NETVÆRK FOR LYMFØDEM (DNL)

Danish Lymphoedema Framework

The Danish Lymphoedema Framework (DNL/DLF) was established in 2010 and is an active partner of the International Lymphoedema Framework (ILF).

DNL/DLF is recognised as a professional interdisciplinary network of medical doctors, nurses, physiotherapists, as well as patients and industry partners. DNL/DLF works across personal and professional interests to:

- Raise awareness and spread knowledge about lymphoedema.
- Advocate for cost free treatment of lymphoedema in Denmark.
- Be an integrated, active partner in ILF and to base its work on ILF's consensus- and position documents.

The DNL/DLF steering committee integrates representatives of the Danish Knowledge Centre for Lymphoedema (Bispebjerg Hospital, Copenhagen) as well as The Danish Society of Lymph Therapists and the patient association Danish Lymphoedema Association (DALYFO).

DNL/DLF is one of 15 national lymphoedema frameworks of the ILF. National frameworks are national associations working nationally to uphold the objectives and philosophy of the ILF. The national frameworks are obliged to put the patients at the center of all their activities and to cooperate in multidisciplinary partnerships between all national stakeholders.

Read more about DNL/DLF
www.dnl-dlf.dk

ILF INDUSTRY PARTNERS



The vision of the International Lymphoedema Framework (ILF) is to bring the lymphoedema community (patients, practitioners, researchers, industry, public and private healthcare groups, government agencies and others) together to work towards improved management of lymphoedema and related disorders. We consider industry partners an important part of advancing our knowledge, exploring what is needed to improve lymphoedema management and gaining better outcomes for all.

We are grateful to the our / the above mentioned ILF Industry Partners who make the work of the ILF possible throughout the year.

ORAL ABSTRACTS



[1] EFFECT OF MECHANICAL VENTILATION ON PERIPHERAL LYMPHATIC FUNCTION - DO HIGH INTRA-THORACIC PRESSURE REDUCE LYMPHATIC FLOW?

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Introduction: Our lymphatic system transports fluid back to our blood circulation via the thoracic duct. Three driving forces characterize this drainage. The active pumping of the lymphatic vessels, the external pressure from surrounding pulsating arteries and muscles and finally the changes in the intrathoracic pressure during respiration. The intrathoracic pressure changes towards a more positive pressure when undergoing mechanical ventilation. We hypothesize that this change in pressure reduces the lymphatic flow in both the central and, subsequently the peripheral lymphatic system, as it works unidirectionally.

Aim: To investigate whether changes in intrathoracic pressure affect the flow in peripheral lymphatic vessels of the lower limbs.

Method: This study is an analytical, experimental study of 15 patients between 18-35 years of age, undergoing surgery for jaw malformations. Indocyanine Green (ICG) is injected intradermally in three places on one of the lower limbs: distally in the first and fourth interdigital spaces and behind the medial malleolus. ICG is absorbed by the lymphatic capillaries and transported into the larger lymphatic vessels and towards the thoracic duct. This process is visualized using Near Infrared Fluorescence (NIRF) imaging where pulsatile movements of lymph fluid, and thus contraction frequency is measured. Recordings consists of 6-minute sequences performed pre-, peri-, and post-operatively. Peri-operative recordings are done at both normal and high ventilation pressures followed by a complete disconnection of the ventilation tube for 1 minute, before going back to normal ventilation protocol. Normality in distribution will be tested using q-q plots, and normally distributed data will be reported as means with standard deviation (SD). P values ≤ 0.05 are considered statistically significant. Outcomes are measured as contraction frequency, defined as visible pulsatile movements of packets of ICG filled lymph fluid per minute and contraction velocity, defined as the velocity of each pulsatile movement towards the central lymphatic system.

Results: Results are pending.

Conclusions: If the hypothesis is confirmed, it could provide valuable knowledge on the pathophysiology behind lymphoedema related to both surgery and intensive care unit stays. Additionally, patients born with complex cyanotic congenital heart disease might especially benefit from more in-depth knowledge about the lymphatic circulation under mechanical ventilation, as many of these patients have compromised lymphatic function while also requiring multiple surgeries throughout their lifetime.

Findings should be investigated in larger studies.

[2] LYMPHATIC FUNCTION AND MORPHOLOGY IN THE UPPER EXTREMITIES OF BREAST CANCER TREATED WOMEN - A FOLLOW-UP STUDY

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Introduction: Axillary surgery and radiation therapy (RT) are significant risk factors for developing breast cancer related lymphedema (BCRL). Lymphatic contractile function is changed and distinct pathological lymphatic patterns are described in BCRL patients, but it is unknown whether these changes occur before clinical edema is detectable and how the function changes over time.

Aim: We aimed to investigate the baseline lymphatic vessel function and morphology in the upper extremities of breast cancer patients just after ended therapy and following the changes in lymphatic characteristics that occur over time as well as correlating these findings to the BCRL development. Further we aimed to reveal the lymphatic reserve pumping capacity amongst these patients during a lymphatic stress-test.

Method: The study population consists of 34 breast cancer patients treated with adjuvant strategy. The lymphatic vessels in the upper extremities were examined at baseline a few weeks after ended RT and at follow-up 6-12 months later. Contraction frequency, velocity, pumping pressure and the morphology of lymphatic vessels were described using Near-Infrared Fluorescence (NIRF) imaging in real time. Lymphatic stress-test was performed using hyperthermia.

Results: In total, 34 patients were investigated at baseline and 29 patients completed follow-up examination. During follow-up 46% of the patients presented with lymphatic morphological abnormalities with a degree of dermal backflow and 6 patients developed BCRL. At follow-up contraction frequencies (CF) in the treated arm were 23% lower than in the control arm ($p=0.040$), whereas no difference was observed at baseline ($p=0.53$). Since primary exam, CF in the treated arm decreased by 40%, ($p=0.028$) whereas no change was observed in the control arm. During stress test induced by hyperthermia, the treated arms with abnormal morphological patterns were not able to increase CF as were the remaining subgroups.

Conclusions: Lymphatic function in the treated arm lowered over time after adjuvant breast cancer treatment. The presence of morphological abnormalities in asymptomatic arms may be associated with weak lymphatic pumping capacity, which could indicate a subclinical initial phase of BCRL development.

The data elucidate the characteristics of the changes taking place in the lymphatic vessels after breast cancer treatment and could provide new insight to detecting which subgroup of patients that could benefit from prophylactic treatment prior to developing BCRL and thereby postpone or completely disallow this devastating complication to occur.

[3] WAYS TO COLLECT LYMPHATIC CIRCULATION IN PATHOLOGICAL CONDITIONS

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Introduction: The lymphatic system reacts especially quickly to changes in blood circulation. In addition to the pathology of the directly lymphatic system of trauma, blood diseases, peripheral nervous systems, and others are most directly related to the lymphatic system. Shifts in the local and general immune defence of the body are largely dependent on the insufficiency of the functions of the lymphatic system, in particular the lymph nodes.

Aim: Using the features of the participation of the lymphatic system in the development of pathological conditions. Microcirculation and metabolic processes are carried out with the participation of the lymphatic system, violations of these processes affect the activity of the lymphatic vessels and, conversely, the pathology of the latter causes gross shifts in the movement of water and substances within the tissues and body fluid. Very few diseases in which the lymphatic system would be indifferent, it is primarily or secondarily involved in the pathological process. It is impossible not to take this into account, and in the treatment of patients, it is necessary to provide for means of complex therapy that correct various aspects of the activity of the lymphatic system.

Method: We have developed a method of regional lymphatic therapy (Dzhumabaev S.U. et al.) Aimed at correcting lymph formation and lymph flow in a certain affected pathology of the anatomical region. From the point of view of aiming, rationality of the impact, sparing of the energy resources of the body, in particular the lymphatic system, in most cases is more shown than the effect on the entire system.

Results: Depending on the region of influence and the selected lymphatic vessel for introducing drugs into its lumen, the zone of influence of regional lymphatic therapy may expand or contract. Correction of microcirculation can be done by: stimulation of lymph formation and lymphatic drainage, inhibition of lymphogenesis and lymphatic drainage, correction of lymphocoagulation.

Conclusions: The use of correction of lymph circulation provides an improvement in the final results, which is confirmed by both experimental studies and clinical observations.

[4] EFFECTIVENESS OF MANUAL LYMPH DRAINAGE, IN ADDITION TO DECONGESTIVE LYMPHATIC THERAPY, FOR THE TREATMENT OF BREAST CANCER-RELATED LYMPHOEDEMA: SECONDARY OUTCOMES OF A MULTI-CENTRE RANDOMISED CONTROLLED TRIAL (EFFORT-BCRL TRIAL)

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Introduction: Although worldwide applied for the treatment of breast cancer-related lymphedema (BCRL), the effectiveness of manual lymph drainage (MLD) remains unclear. Recently, the method of MLD has been optimised (i.e. fluoroscopy-guided MLD). Previous analyses of this trial revealed that, in patients with chronic BCRL, a benefit of MLD in addition to decongestive lymphatic therapy (DLT) could not be demonstrated in terms of changes in excessive volume reduction of the arm/hand and change in excessive volume accumulation at the shoulder/trunk (primary outcomes), and in changes of lymphedema-specific and general quality of life as well as in infection rate (first secondary outcomes).

Aim: To investigate the effectiveness of fluoroscopy-guided MLD additional to DLT and compared to traditional or placebo MLD, on changes in amount of tissue water, extracellular fluid and skin characteristics at the level of the arm and trunk (secondary outcomes).

Method: This three-arm, double-blinded RCT has been conducted in five hospitals in Belgium. All participants received standard DLT (education/skin care/compression therapy/exercises) and were randomised to one of the three groups. Participants daily received 60 minutes of treatment during the 3-week intensive phase and 18 sessions of 30 minutes during the 6-months maintenance phase. Outcomes of this analysis were the changes in: local tissue water, extracellular fluid, skin thickness, elasticity of the skin and fibrosis. Measurements were performed at baseline, after intensive treatment, after 1, 3 and 6 months of maintenance treatment and after 6 months of follow-up.

Results: 194 participants with unilateral BCRL were included. Regarding the amount of local tissue water, extracellular fluid, and skin elasticity, no statistically significant differences in reduction or improvement *between* the groups were present at any time ($p > 0.05$). The change in decrease in thickness of the subcutis was significantly different *between* the fluoroscopy-guided MLD and the traditional MLD group at the end of follow-up ($p < 0.05$) in favor of fluoroscopy-guided MLD, and was significantly different *between* the placebo MLD and the traditional MLD group at the end of the maintenance treatments ($p < 0.05$) in favor of placebo MLD. The change in skin fibrosis reduction was statistically significant *between* the fluoroscopy-guided MLD and the

traditional MLD group at 12 months post-intensive phase ($p < 0.05$), in favor of fluoroscopy-guided MLD. No corrections for multiple testing occurred.

Conclusions: The clinical merit of MLD additionally to DLT in reducing local tissue water, extracellular fluid or skin thickness, and in improving skin elasticity and fibrosis in patients with chronic BCRL, is limited.

[5] TREATMENT OF BREAST CANCER-RELATED LYMPHEDEMA WITH ADIPOSE-DERIVED REGENERATIVE CELLS AND FAT GRAFTING: AN ONGOING RANDOMIZED, PLACEBO-CONTROLLED AND DOUBLE-BLINDED CLINICAL TRIAL

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Introduction: Lymphedema is one of the most common and severe side effects of breast cancer treatment with axillary lymph node involvement. Currently, only conservative treatment is available. Preclinical lymphedema research has shown promising potential for adipose-derived cell therapy and we have previously conducted the first in human pilot study with favorable results.

Aim: We are now conducting a randomized, blinded, and placebo-controlled trial with an emphasis on efficacy, effectiveness and safety.

Method: This study is an ongoing single-center, phase II, randomized, placebo-controlled, double-blinded clinical trial. A total of 80 patients are randomized in a 1:1 ratio to receive either adipose-derived regenerative cells delivered to the axillary region in combination with a scar-releasing lipotransfer or placebo. Outcomes include arm volume, lymph drainage, tissue composition, safety, quality of life, erysipelas events, and discontinuation of conservative treatments. Outcomes are compared before treatment and 3, 6, 9, and 12 months after treatment. All patients undergo abdominal/thigh liposuction in general anesthesia and the cell treatment is delivered through masked syringes. Patients are discharged later the same day.

Results: No results presented, as the trial is still ongoing.

Conclusions: This is the first randomized study evaluating the safety and efficacy of adipose-derived regenerative cells in patients with breast-cancer related lymphedema and one of the largest prospective studies on non-conservative treatments for lymphedema. During the first 12 months of trial initiation, we have evaluated more than 250 patients, of which 76 were deemed eligible and have been recruited.

[6] THE LONGITUDINAL COURSE OF BREAST EDEMA IN BREAST CANCER PATIENTS TREATED WITH BREAST CONSERVING SURGERY AND RADIOTHERAPY - 1 YEAR OF FOLLOW-UP

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Introduction: Breast edema is a morbidity encountered by breast cancer patients following breast-conserving surgery (BCS) and radiotherapy. In contrast to lymphedema of the arm, breast edema is far less explored in the scientific literature. Currently, its time course is still unclear. Nevertheless, breast complaints following breast cancer treatment are very common. Complaints of the breast which are associated with breast edema are swelling, pain, redness, tensed skin, peau d'orange, hardness, heaviness and pitting sign

Aim: To describe the longitudinal course of breast edema over 1 year in breast cancer patients who underwent BCS and radiotherapy.

Method: In this prospective cohort study, female breast cancer patients older than 18 who were allocated for BCS followed by radiotherapy were recruited prior to the start of radiotherapy. Participants were asked to fill in the Breast Edema Questionnaire (BrEQ) on several time points: after BCS and prior to radiotherapy (T1), immediately after termination of the radiotherapy (T2), 3 months (T3), 6 months (T4) and 12 months post-radiotherapy (T5). By means of the BrEQ; symptoms associated with breast edema are scored on a scale from 0 (no distress) to 10 (maximal distress). Validity and reliability of the BrEQ have been proven in a previous study.

Results: In total, 111 patients were included in this study. All required data were retrieved from 107 participants at T1, 74 participants at T2, 66 participants at T3, 62 participants at T4 and 56 participants at T5. At T1, the prevalence was 54.2%. A peak prevalence of breast edema was seen at T2 (62.2%). Thereafter, the prevalence declined to 54.5%, 53.2.9% and 48,2% at respectively T3, T4 and T5.

Conclusions: BCS followed by radiotherapy results in a high prevalence of breast edema, with a peak immediately after the termination of radiotherapy. Although the high prevalence of breast edema, it seems that the number of patients actually needing treatment is low.

[7] TREATMENT OF BREAST CANCER-RELATED LYMPHEDEMA WITH TOPICAL TACROLIMUS: A PROSPECTIVE, OPEN LABEL, SINGLE-ARM PHASE 2 PILOT TRIAL

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Introduction: Breast cancer-related lymphedema (BCRL) is a progressive and life-long side effect to breast cancer treatment. One in three patients treated with axillary lymph node dissection and nodal radiation suffer from this condition. Cluster of differentiation 4 positive (CD4+)-cells play a key role in the development of BCRL as they facilitate inflammation and inhibit lymphangiogenesis. Tacrolimus is an anti-inflammatory and immunosuppressive macrolide that targets CD4+ cells. Treatment of lymphedema with topical tacrolimus has revealed promising results in pre-clinical trials.

Aim: This first-in-human trial evaluates the feasibility and safety as well as the effect of tacrolimus in females with BCRL stage I-II (International Society of Lymphology).

Method: We conducted this prospective open label, single-arm, phase 2 pilot trial from September 2020 to April 2021. Eighteen female patients with BCRL stage I-II were treated with Protopic (0.1% tacrolimus) once daily for six months with follow-up after three and six months. The primary outcome was change in arm volume. The secondary outcomes were changes in lymphedema-index score, health-related quality of life, lymph flow and lymph function, as well as safety and feasibility of the trial design.

Results: We found a reduction in mean lymphedema arm volume of 130.44 mL \pm 210.13 ($p < 0.05$), corresponding to a relative reduction of 3.6 % \pm 5.46 ($p < 0.05$). Lymphedema-index score was reduced by 3.54 \pm 4.98 ($p < 0.05$) and health-related quality of life-scores was significantly improved, specifically in the domains: physical function, social function, limitations due to physical health problems, bodily pain as well as overall functioning of the arm, shoulder, and hand ($p < 0.05$). Three patients (16.7 %) improved, and none worsened in lymph flow and functioning according to the MD Anderson scale. There were no changes in lymph flow and functioning according to the Arm Dermal Backflow scale.

Conclusions: Treatment with Protopic is safe and feasible in females with BCRL stage I-II. Results from this trial suggest that tacrolimus has an alleviating effect on BCRL in terms of volume reduction, lymphedema-index, and health-related quality of life. Assessments of lymph flow and function were positive, however inconclusive. Larger randomized controlled trials are needed to verify these findings.

[8] THREAT OF BREAST CANCER-RELATED LYMPH-EDEMA AND ARM USE INTENTIONS IN A PROSPECTIVELY SCREENED COHORT OF WOMEN TREATED FOR BREAST CANCER

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Introduction: Breast cancer-related lymphedema (BCRL) is a widely feared complication of breast cancer (BC) treatment. In addition to objective arm volume measurements, patients' quality of life (QOL) and distress about BCRL should be screened. Although BCRL risk varies based on BC treatment, women's fear may not be concordant with individual BCRL risk.

Aim: To analyze perceived threat of BCRL and intention to engage in protective arm behaviors across BCRL risk groups: axillary surgery type with or without regional nodal irradiation and body mass index at diagnosis.

Method: A seven-question survey taken from the Arm Activity Survey was distributed from 2008 to 2018. 8,539 surveys from 1,600 patients were analyzed, with 2.16 years median follow-up and median of 4 responses per patient. Patients responded using a four-point Likert scale and responses were divided into post-surgical time periods from 0-48 months. For each patient, one survey with the highest score (i.e. strongest agreement) was analyzed per time period. Mixed effect repeated measures logistic regression models were used to assess the effects of different baseline risk-based predictors of interest for each question response.

Results: While responses to all survey questions were analyzed, two questions were the most significant: "The possibility of developing arm swelling or making it worse worries me" (Q1) and "I am more careful with my arms now than I was before my BC treatment" (Q2). Odds ratios (OR) were used to assess differences in levels of agreement between risk groups. There was a significant difference between patients with axillary lymph node dissection (ALND) and sentinel lymph node biopsy (SLNB) for Q1 (OR: 11.5 (6.89-19.1, p<0.0001)) and Q2 (OR: 63.7 (31.1-130.7, p<0.0001)). Patients with SLNB expressed fear of BCRL compared to patients with no nodes removed: Q1 (OR: 1.48 (0.81-2.70, p=0.21)) and Q2 (OR: 3.25, 1.57-6.70, p=0.0014). Patients with ALND agreed more with Q1 and Q2 than those with SLNB, but BCRL was also perceived as a threat by patients with SLNB.

Conclusions: Patients within a screening program who are at higher risk of BCRL are more likely to be worried about developing arm swelling and to be careful with their arm. Although this is in contrast to previous studies (McLaughlin et al. 2008), we hypothesize that this is associated with individualized patient education within the BCRL screening program. This reiterates the benefit of a screening program, and future research should be done to investigate the impact of screening programs on QOL directly.

[9] EARLY INTERVENTION FOR BREAST CANCER-RELATED LYMPHEDEMA: RESULTS FROM A PROSPECTIVE SCREENING PROGRAM

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Introduction: Preliminary data suggests early intervention for low-volume swelling (LVS) (relative arm volume change (RVC) 5-<10%) may prevent progression to breast cancer-related lymphedema (BCRL) (RVC ≥10%). Although movement has been toward early treatment by certified lymphedema therapists (CLTs), resources are scarce and treatment threshold has not been well-supported in the literature. Further research is required to establish definitive data from a prospective surveillance program, incorporating measurements, symptoms and clinical exam.

Aim: To assess the effectiveness of early intervention for LVS in preventing progression to BCRL in a cohort of women treated for breast cancer (BC) prospectively screened for BCRL.

Method: This was a retrospective descriptive study of 42 women treated for BC, prospectively screened for BCRL from preoperative baseline. Patients were referred to the certified lymphedema therapist (CLT) upon developing LVS (RVC 5-<10%). Treatment included a combination of compression, exercise, kinesiotape, manual therapy, and patient education. Pre-and post-treatment perometry, clinical examination and symptoms data were collected.

Results: The cohort consisted of 42 females with a mean age of 53.7 years. 25 patients (59.5%) underwent axillary lymph node dissection (ALND), 29 underwent regional nodal radiation (RLNR) and 30 patients had a BMI ≥25 kg/m² at time of BC diagnosis. Median RVC pre-CLT treatment was 6.29% (range 5.20%-9.96%). Patients underwent a median of 3 CLT visits over a median of 56 days. Treatment parameters, clinical exam and symptom findings pre- and post-treatment will be described. Patients obtained a median net decrease in RVC of 1.70% (range -14.77%-14.44%) during treatment and 39/42 sustained RVC <10% at end of treatment. Perometry at last follow-up (median 9.90 months post treatment) demonstrated maintenance of median RVC from end of treatment (0% change). RVC <10% was maintained in 31/42 patients (73.8%) at last follow-up, indicating that 11 patients had progressed to BCRL. Of these, 7/11 and 8/11 underwent ALND and RLNR respectively.

Conclusions: In this cohort of women treated for BC prospectively screened for BCRL, early intervention prevented progression to BCRL in 74% of patients. From recent data, we would anticipate 15 patients would have progressed to BCRL after LVS, which indicates a 27% reduction in progression with early intervention in this study. Of note, most patients who progressed to BCRL had undergone ALND and RLNR for BC, placing them at high BCRL risk. We recommend prospective BCRL screening and hypothesize that with close long-term follow-up after early intervention, further BCRL prevention may be achieved.

[10] COMPARING MEASUREMENT METHODS FOR BREAST CANCER-RELATED LYMPHEDEMA SCREENING: THE NEED FOR UNIVERSAL AGREEMENT

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Introduction: There is a lack of consensus regarding diagnostic criteria for breast cancer-related lymphedema (BCRL) given varied measurement methods and thresholds utilized. Assessing agreement in BCRL diagnosis using commonly used measurement techniques may help to establish consensus in this area.

Aim: To assess (1) agreement across methods diagnosing at relative volume change (RVC) $\geq 10\%$ and bioimpedance (BIS) L-Dex score of ≥ 7.1 (2) agreement of BCRL diagnosis via absolute volume differences obtained by perometry (PER) and girth measures (GM) (3) identification of BCRL amongst patients with symptoms or edema on clinical exam.

Method: This is a cross-sectional study of 60 females treated for breast cancer and prospectively screened for BCRL. BCRL diagnostic thresholds included: (1) arm volume difference $\geq 10\%$ via GM (National Lymphedema Network (NLN) and every 4 cm (Q4); (2) Perometry (PER) (absolute difference (ABS) and RVC); and (3) BIS L-Dex > 7.1 . Fisher's exact tests were computed to assess correlation between binary measurements using RVC, PER, NLN, Q4 and BIS. McNemar's test for disagreement and Cohen's Kappa coefficient were performed.

Results: There was no significant association between RVC and BIS ($p=0.24$) and level of agreement between was minimal and non-significant (McNemar's test $p=0.125$, Cohen's Kappa 0.28 (95% CI [-0.16,0.72], $p=0.24$). For BCRL diagnosis based on absolute measurements, PER was positively associated with NLN and Q4 (both $p<0.0001$), and NLN was positively associated with Q4 ($p<0.0001$). Level of agreement between PER and NLN and PER and Q4 was moderate (McNemar's test $p=0.18$, Cohen's Kappa 0.64 (95% CI [0.43,0.85], $p<0.0001$; McNemar's test $p=0.69$, Cohen's Kappa 0.77 (95% CI [0.60,0.94], $p<0.0001$ respectively). Level of agreement between NLN and Q4 was strong (McNemar's test $p=0.25$, Cohen's Kappa 0.88 (95% CI [0.74,1.00], $p<0.0001$).

Seventeen patients had symptoms data; 14 reported symptoms (14/14 reported swelling, 3/14 heaviness). All 14 patients with and 2 of 3 patients without symptoms had swelling on clinical exam. Patients who reported swelling were most often diagnosed with BCRL via perometry (RVC or PER) (13/14 and 12/14 respectively).

Conclusions: When incorporating preoperative baseline, imperative for accurate BCRL diagnosis, volumetric measures and L-Dex scores have non-significant, minimal agreement. Using absolute measures, varied volumetric methods have at least moderate level of agreement. All patients reporting symptoms had swelling on clinical exam, and BCRL was identified most often via perometry in this group. There is discordance in BCRL diagnosis between measurement modes, and lack of diagnostic criteria will continue to hinder progress in this area.

[11] EFFECT OF THERAPEUTIC ULTRASOUND ON BREAST CANCER RELATED LYMPHEDEMA: RANDOMIZED SINGLE BLIND STUDY.

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Introduction: Therapeutic Ultrasound (TU) is often used to treat people with pain and a various musculoskeletal injuries and to promote soft tissue healing. Micromassage effects, slightly increased heat in a cellular level, modification of cell metabolism and microcirculation can be the potential effects of TU and can also improve lymph flow and reduce fibrosis.

Aim: To determine the role of TU in patients with breast cancer related lymphedema (BCRL) in addition to complex decongestive therapy (CDT).

Method: Thirty patients (mean age 53,4±10,16) with unilateral upper BCRL were included in the study. After randomization, 15 patients (group 1) underwent CDT treatment+ TU treatment and 15 patients (group 2) underwent CDT. All patients underwent CDT which included manual lymphatic drainage (MLD), compression therapy with a short stretch bandage for 23 h per day, intermittent pneumatic compression pump, multi-layer compression bandaging, lymphedema exercises and skin care. After CDT, group 1 patients received TU therapy. Continuous TU in circular fashion was applied to the whole arm with an intensity of 1.5W/cm², a frequency of 3MHz and a 0.5-cm² soundhead and lasted 10 minutes per session. Ultrasound probes were applied to the arm and forearm according to the manual lymphatic drainage pathways. The CDT was performed for 1 hour a day 5 days a week for 3 weeks.

Results: The initial lymphedema volume of group 1 was 734.86±401.39 mL and that of group 2 was 854.93±361.55 mL (p=0.325). The lymphedema severity according to percentage of excess volume (PEV) of group 1 was 26.56±13.57 and that of group 2 was 31.08±10.72, which was categorized as moderate lymphedema (p=0.187). After 15 sessions of CDT program, in group 1, lymphedema volume decreased to 388.60±285.87 mL (post-CDT p=0.001) while in group 2, lymphedema volume decreased to 732.8±367.35 mL (post-CDT p=0.005), and in group 1, PEV decreased to 13.99±10.21 (post-CDT p=0.001) while in group 2 PEV decreased to 26.84±9.98 (post-CDT p=0.028). Among the two groups, improvement in extremity volumes and PEV values of group 1 patients were significantly higher than group 2 patients (p=0.001 and p=0.002 respectively). The ultrasonographically determined cutis and subcutis thicknesses in group 1 patients were decreased more than group 2 patients (p<0.05).

Conclusions: TU can be a safe and an effective method to the management of BCRL patients.

[12] THE COMPARISON OF MANUAL LYMPH DRAINAGE, KINESIO-TAPING, AND LOW-LEVEL LASER IN ADDITION TO MULTI-LAYER BANDAGING, EXERCISES, AND SKIN CARE IN PATIENT WITH STAGE 2 BREAST CANCER RELATED LYMPHEDEMA

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Introduction: Although compression therapies are the cornerstone for the treatment of lymphedema, no studies have reported the comparison of manual lymphatic drainage, lymphatic kinesio-taping and low-level laser treatment.

Aim: We planned a randomized controlled study to compare the effects of three different modalities on limb volume, quality of life, upper extremity function, neuropathic pain and shoulder range of motion in patients with stage 2 breast cancer related lymphedema.

Method: 45 female patients with stage 2 lymphedema were included in the study. Patients were randomized to 3 groups by envelope extraction method. The groups were treated with manual lymphatic drainage, kinesio taping and low-level laser therapy, in addition to multilayer compression bandage, exercise, and skin care for 5 days in a week for three weeks. Lymphedema compression garment was recommended to all patients at the end of the treatment and they were followed up for three months.

The arm volume was calculated by a formula for truncated cone using circumferential measurements. Quality of life was measured using the LYMQOL ARM (Lymphoedema Quality of Life Tool), upper extremity disability measurement by using Quick DASH questionnaires, neuropathic pain assessment with pain detect Questionnaire (PDQ) and shoulder motion range by plastic goniometer at the beginning and the end of treatment, after one month and three months. The data collected from the patients were entered into the SPSS 21.0 package program and a data set was formed and statistical analyzes were performed. ANOVA (Repeated measures ANOVA) test was used for repeated measurements for parametric repetitive measurements and Friedman test was performed for non-parametric repetitive measurements.

Results: The diagnosis and treatment characteristics of breast cancer surgery, and initial parameters were similar in all groups. The limb volume of affected side was decreased in all groups and improvement in the kinesio taping group was significantly higher than the MLD and laser groups. The results showed improvement in quality of life in all groups, but continued in the 3rd months only in the kinesio taping group. Quick DASH scores were significantly decreased in all groups, but continued only in laser and kinesio taping groups in the 3rd months. Pain DETECT scores were significantly decreased after treatment in all groups

Conclusions: Lymphatic kinesio taping was found to be effective in volume reduction, quality of life and upper extremity function in the long-term. It may be an alternative to manual lymphatic drainage and laser in stage 2 lymphedema.

[13] A MULTI-CENTERED RANDOMIZED CONTROL CROSS-OVER STUDY TO EVALUATE THE SAFETY AND EFFECTIVENESS OF KOYA DAYSPRING ACTIVE MOBILE COMPRESSION SYSTEM VS. AN ADVANCED PNEUMATIC COMPRESSION DEVICE FOR TREATING BREAST CANCER RELATED LYMPHEDEMA

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Introduction: When MLD and static compression garments are not sufficient to reduce or maintain limb volume, gradient compression devices may be prescribed for daily home use. The Dayspring compression system is a novel wearable device that provides similar calibrated gradient therapy using a shape memory alloy to activate flexible frames along the affected limb to stimulate lymphatic flow without the use of pumps, allowing the user to be mobile during treatment.

Aim: To evaluate the Koya Dayspring calibrated gradient segmental compression in contrast to an advanced pneumatic compression device (APCD).

Method: Up to 50 patients with breast cancer-related lymphedema (BCRL) were enrolled at 6 sites. Subjects were randomized to receive home treatment with either the Dayspring System or the Flexitouch Plus pneumatic pump for at least 45 minutes per day for 28 days. A 28-day washout period was followed by a crossover to the other device for another 28-day treatment period. Limb volume and the LYMQOL, a validated QoL tool for lymphedema, were completed at the beginning and end of each treatment period. Adherence to daily therapy was measured.

Results: Subjects were nearly all female. At the interim analysis, there was no statistically significant difference in limb volume changes between the two devices. At the interim analysis, there was a statistically significant improvement in overall QoL, and in the subscales representing symptoms, appearance, function and mood over the study period. Adherence to Dayspring therapy was found to be higher than the adherence to Flexitouch Plus. Majority of the subjects reported a categorical preference for Dayspring.

Conclusions: The clinical benefits of compression devices have been appreciated over decades of use. Technology advancements have accelerated and with the Dayspring innovation users can now be mobile and active. In this randomized cross-over design study, patients were able to experience treatment with both a legacy pneumatic compression pump and the Dayspring wearable compression device. Both devices stimulate the lymphatics in a distal to proximal motion to reduce or maintain limb volume. The LYMQOL measures lymphedema QoL and should similarly capture any changes over time regardless of which device is used. With the chronic daily demand of lymphedema treatment over the patients entire life, mobile and wearable smart treatment options that more easily fit into the daily patterns of a patient's life are more likely to be used and to provide benefits.

[14] EFFECTIVENESS OF COMPRESSION SLEEVES IN PREVENTING BREAST CANCER-RELATED LYMPHOEDEMA: A RANDOMISED CONTROLLED TRIAL

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Introduction: Upper limb lymphoedema secondary to treatment for breast cancer continues to be prevalent for those treated with axillary lymph node dissections (ALND). Prevention is critical in averting the chronic tissue changes associated with breast cancer-related lymphoedema (BCRL). Although there is preliminary evidence of compression sleeve in preventing BCRL, adequately powered randomised controlled trials are needed to confirm this finding.

Aim: To evaluate the efficacy of using a compression sleeve with usual care in preventing arm swelling in women at high risk for breast cancer-related lymphoedema.

Method: Women (n=307) who had undergone axillary lymph node dissection (ALND) were randomly assigned to either a compression sleeve or control group. In addition to the usual postoperative care, participants in the compression group were provided with two compression sleeves to wear from the first postoperative day until three months after completing adjuvant treatments. Arm swelling was determined using thresholds based on bioimpedance (BIS) thresholds based on normative thresholds and relative arm volume increase (RAVI) more than 10 percent from baseline separately. The incidence of arm swelling and survival time free from arm swelling for both groups were compared using Kaplan-Meier analysis, and hazard ratios were estimated with univariate and multivariate Cox regression models for BIS and RAVI thresholds independently.

Results: Arm swelling occurred less frequently and developed later in the compression group compared to the control group (log-rank for BIS p=0.005 and RAVI: p=0.015). The hazard ratio for developing BCRL was 0.61 (95% CI: 0.43 to 0.86) p=0.004 based on BIS and 0.51 (95% CI: 0.29 to 0.89; p=0.017) based on RAVI in the compression group relative to the control group. The estimated cumulative incidence of arm swelling at one year was significantly lower in the compression group (BIS=39%, RAVI=12%) than the usual care group (BIS=52% and RAVI=23%).

Older age (Cox analysis: HR = 1.04 [95% CI: 1 to 1.1]; p < 0.001), and neoadjuvant chemotherapy (Cox analysis: HR = 1.81 [95% CI: 1.2 to 2.7]; p = 0.003) were independent factors significantly decreasing arm swelling-free survival time.

Conclusions: Prophylactic use of a compression sleeve compared to the control group reduced and delayed the occurrence of arm swelling in women at high risk for BCRL in the first year after surgery for breast cancer.

This trial was registered at the Clinical Trial Registry of India (CTRI/2017/12/010762)

[15] PREVALENCE OF AXILLARY WEB SYNDROME AND ADHESIVE CAPSULITIS IN BREAST CANCER: A RETROSPECTIVE STUDY

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Introduction: In Singapore, Breast cancer is the most common cancer in the female population. It is estimated that the lifetime risk for women of developing breast cancer is 1 in 14 women by 75years old. Although overall survival rates have improved drastically over the past decade, the potential sequelae of breast cancer treatments are often under-recognized and can lead to significant impairment and diminished quality of life. The burden of these complications on the healthcare system has also been shown to be significant. It is clear that more needs to be done to first identify and subsequently manage such complications.

Common causes of shoulder dysfunction post breast cancer treatment include the development of axillary web syndrome (AWS) and/or adhesive capsulitis also known as frozen shoulder (FS). AWS presents as palpable tight cords of tissue surrounding the axillary area and may extend down to the medial aspect of upper extremity to as far as base of the thumb. FS is characterized by painful restriction of passive and active movement of the shoulder. Women with more extensive surgery involving axilla lymph node dissection and subsequent radiotherapy have a higher incidence of shoulder impairment.

Aim: The aim of this study is to determine the prevalence of AWS and frozen shoulder, and its association with distress in outpatient breast cancer patients undergoing a community rehabilitation program in Singapore.

Method: Visible or palpable AWS is determined during maximal shoulder abduction. Range of motion of shoulder (flexion, abduction, internal and external rotation) is recorded using a goniometer in comparison to the opposite shoulder. Detection of clinically significant distress is determined by the NCCN Distress Thermometer and Problem List for Patients

Results: 140 breast cancer patients were examined during initial visit to Singapore Cancer Society – Cancer Rehabilitation Centre. AWS was found in 33 patients meaning an incidence of 23.6%. 20.7% of patients (29/140) were clinically diagnosed with FS. Up to 40% of breast cancer patients self-reported distress level of more than 4 on a 10 point scale.

Conclusions: It is advisable for healthcare providers in Singapore to be educated on the prevalence of AWS and FS in breast cancer patients. Patients at risk for AWS and/or FS should undergo a structured rehabilitation program to minimise shoulder disability and its associated complications. The element of psychosocial well-being warrants further professional intervention so as to maximise long term quality of life and functional recovery for breast cancer survivors.

[16] EVALUATION OF A SPECIALIST LYMPHOEDEMA SERVICE FOR CHILDREN AND YOUNG PEOPLE

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Introduction: Previous estimates of prevalence of lymphoedema in CYP were based on a small study that gave an estimated average annual incidence of 1.15 per 100,000, where in 2014, an audit was carried out of the number of children with lymphoedema across the UK. Based on those figures there would be a prevalence of 4/100,000 children with lymphoedema. Lymphoedema services for 'Children and Young Adults' in Wales commenced November 2015. Children and young adults are assessed and supported closer to home at lymphoedema clinics located within their health boards, as opposed to traveling to England

Aim: The aim was to evaluate the first three years of a Children and Young People's (CYP) Lymphoedema service including incidence, severity, impact and treatment model types. The outcome of the audit would inform a CYP strategy for delivering effective specialist lymphoedema care closer to home.

Method: To evaluate the period 2015 to 2018, an audit template captured patient specific information, Patient Reported Outcome Measures (PROMs) and staff opinion from focus groups. A statistician supported quantitative analysis and qualitative data underwent thematic analysis in relation to literature and existing CYP strategy.

Results: Over the 3 year period, 286 CYP had been referred from a population of 909,346 aged 0-25 years, the data to the end of 2018, found a prevalence of 31 per 100,000 CYP with lymphoedema among a population aged 0-25 over the three-year period a higher incidence than previously recorded in the literature.

New information on patient characteristics, symptoms and changes over time were shown and the delay in diagnosis reported in literature was echoed. PROMs identified 16 descriptors had statistically significant change at first follow-up with 4 significant at the second. Potential improvements to PROMs were also recognised. Staff focus groups suggested availability of experienced mentors, Education and a need to clarify basic competencies for working with CYP.

Conclusions: Based on the incidence, a business case in 2019 secured an additional CYP-specific national post, with each health board increasing availability of CYP therapists. Following the qualitative findings, a literature review confirmed lack of research on education standards in managing CYP lymphoedema, resulting in a research proposal being funded. Raising awareness of health professionals, at all levels, became strategy and accredited learning was enhanced.

[17] EUROPEAN REFERENCE NETWORK FOR RARE DISEASES (ERN): PEDIATRIC AND PRIMARY LYMPHOEDEMA NETWORK OF EUROPEAN EXPERT CENTERS

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Introduction: The overall vision of Rare Disease (RD) ERNs is that they will provide the framework for healthcare pathways for RD patients through a high level of integrated expertise. In the ERN's patient's have their own working group and their input is very important. Patients' representatives are active discuss together with professionals to make information and documents to inform patients better.

A rare disease is defined with an incidence of less than 1:2000

Aim: Since 2015 the European commission founded the European Reference Network (ERN) in order gathering the best expertise in Europe to provide accessible cross-border healthcare to patients with rare diseases.

Method: By a uniform and robust process of application, expert center had to obtain an endorsement by their nation government to become member of the ERN. One of the working groups is about pediatric and primary lymphedema. Expert centers from France, England, Netherlands, Belgium, Germany, Slovenia and Finland meet virtually monthly and twice a year face to face. The EU provided a clinical patient management system (CPMS) for all 600 working groups divided in 23 reference networks. The EU provided a clinical patient management system (CPMS) for all 600 working groups divided in 23 reference networks

Results: By working together and learn from each other, making a general patient's pathway, work together with ORPHANet to update the diagnosis and codes, we improved the quality of patientcare enormously. New diagnostics are introduced as the MR-lymphography and gene panels. Monthly we discuss, within a secured network, more than 4 patient cases with rare forms of lymphedema, swelling and syndromes. Furthermore, patients can be referred to another center when there is special treatment or diagnostics available. The costs are covered by the local reimbursement system. In 2020 we will expand the network with applicants from new countries. Other expert centers in the members states are stimulated to form a satellite network with the ERN members. This year we work on recommendations for diagnostics and treatment for PPL, work on a uniform registry and develop clinical trials and research.

Conclusions: The ERN-PPL working group improved the quality of diagnostics and care for patients with pediatric and primary lymphedema in the members states by sharing knowledge, experience and expertise. New multidisciplinary approach is essential with contribution of patient's representatives from many countries.

[18] FITKIDS TRAINING GUIDELINES FOR CHILDREN WITH PRIMARY LYMPHOEDEMA

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Exercise is important for all individuals, especially for those with a chronic condition as lymphoedema (LE). The Center of Expertise for Lymphovascular Medicine (ECL), together with Fitkids developed an exercise program suitable for children with primary LE. The ECL in Drachten is the only tertiary referral center for primary LE in The Netherlands and part of the European Reference Networks. The Fitkids Foundation offers evidence and best practice based fitness and exercise programs for children aged 6 to 18 with a chronic illness, disability or long-term condition in centers all over the Netherlands.

Patients referred to the ECL receive an extensive assessment by a dermatologist, a genetic expert, an edema therapist, a pediatrician and a pediatric physiotherapist to set the diagnosis and to initiate or optimize the treatment program. The assessment of the pediatric physiotherapist is aimed at mapping the activity level, flexibility, strength and motor development, taking age into account.

If necessary, a child may be hospitalized in the ECL.

Important aspects of the treatment program concern education on LE (including risk factors), compression therapy, exercise and self-management in which the parents are closely involved. After this treatment it is important to keep the LE stable and to comply to the Dutch standard of normal activity (NNGB). Most children with LE do not fulfill this standard, a.o. by reasons of lack of confidence, lack of knowledge and/or fear that the LE will get worse.

Fitkids offers a fitness and exercise program. Children train and move in a group for six months to a year under the guidance of a (pediatric) physiotherapist. The ultimate goal is to find a suitable sport. Specific subgoals for children with LE to build up confidence, to move symmetrically, to fulfill the exercise standards and avoid obesity.

By combining the knowledge and experience of both Fitkids and the ECL a specific program for children with primary LE has been developed. This program offers individualized exercise programs based on a uniform intake and supports the uniformity of advices for children with LE. These advices are based on the recommendations of the Pediatric Primary Lymphoedema group.

This upcoming year the Fitkids lymphoedema exercise program will be implemented and evaluated on it's feasibility.

[19] SPANISH EXPERIENCE IN LYMPHEDEMA IN CHILDHOOD AND YOUNG PEOPLE

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Introduction: Primary lymphedema is a rare disease and complex to treat due to its wide genophenotypic expression. Because of this, its management is done through multidisciplinary hospital committees, especially in its visceral, systemic or syndromic manifestation. In all cases it is a chronic and incurable entity that evolves with the individual affecting his biopsychosocial development. Cases of secondary lymphedema in this age range are less frequent

Aim: To know the population from 0 to 25 years old affected by lymphedema treated in our referral center in the last 5 years.

Method: Prospective descriptive controlled study of the population of children and adolescents, aged 0 to 25 years, with lymphedema in our hospital area referred to our rehabilitation service in the last 5 years. Statistical analyses were performed using IBM SPSS Statistics 23

Results: 56 cases, 58.9% females, 78.6% had no family history, the most frequent types of lymphedema were 19.6% syndromic, 19.6% congenital and 19.6% late according to the Sant George 2021 classification. 71.4% were located in the lower extremities. The clinical signs of positive stemmer's were present in 48.2% and positive pitting edema in 44.2%. As the most common complication 28.6% presented cutaneous infection. The diagnostic tests were 82.1% nuclear magnetic resonance (MRI), 42.9% lymphoscintigraphy and genetic test 58.9%. As for treatments, 84% used compression garments, 48.2% decongestive treatment or 41.1% manual lymphatic drainage and 94.6% had been trained in lymphedema health education. 87.5% did not receive another specific multidisciplinary treatment. 76.9% have a normalized schooling and 39.3% are dependent for activities of daily living. In our series 3 exitus were reported

Conclusions: Lymphedema in children and young people in our health care area is mostly primary and is located in the lower extremities, predominantly unilateral. It is more frequent in females with no family history. Diagnosis is based on magnetic resonance imaging and conservative treatment aimed at health education in the family environment and the use of custom-made garments are the main interventions. Most of the subjects have a normal schooling by chronological age and come from an urban environment and are not dependent for activities of daily living

[20] VENOUS LEG ULCERS AND LYMPHEDEMA: MEANS TO IMPROVE THE HEALING PROCESS

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Introduction: When the venous ulcer (VU) is combined to the Lymphedema, the healing process becomes dramatically prolonged and complicated. It is estimated that 93% of VU will heal in 12 months, and 7% remain unhealed for more than 5 years¹. The discrepancy in the obtained results raises a lot of questions. Among these questions: Are the patients realizing the importance of their role?

Are they followed by experts in angiology and venous ulcer management?

Aim: Establish a survey and a therapeutic protocol engaging all the medical team: General Practitioner (GP), Nurses, Dermatologist, Physiotherapists, ... **AND the PATIENT.**

Method: 21 patients met the inclusion criteria:

- Admitted for venous ulcer with oedema.
- Suffering for at least 6 months
- Ankle Brachial Pressure (ABPI) > 0.6

The assessment begins with a precise diagnosis, Duplex ultrasound, Biopsy, Cleaning, disinfection and debridement of the ulcer if necessary; measuring the ulcer's dimensions, taking circumferential measurements of the limb, Complex Decongestive Therapy (CDT) (Manual Lymphatic Drainage (MLD), Compression therapy, circulatory exercises program (CEP), personalized advises based on the survey's answers with the aim of improving the Quality of life (QOL).

Results: The survey showed a lack of information and knowledge in the field, affecting ALL levels:

- **Non appropriate treatment by some Physicians, Nurses and Physiotherapists:** The Ulcer is treated like a simple wound.
- **Lack of knowledge from the patient and lack of explanation to the patients:** at the beginning, 13 / 21 patients were surprized by the means deployed to treat a "wound".
- **The survey showed the absence of a team work outside the clinics:** No real coordination between the therapeutic members before the admission.

After adhering to the treatment protocol, 16 / 21 patients saw their ulcers heal between 3 and 8 weeks.

Conclusions:

These observations, highlighted several crucial points: The importance of the expertise and the knowledge at all levels of all team members.

The importance of the decongestive treatment from the beginning of the ulcer treatment:

"Where there is EDEMA there is NO optimal healing"

The importance of empowering patients to participate actively in their own treatment:

"Listen to the Patient.

Explain it to the Patient

Do it With the Patient".

[21] DIFFERENT DIAGNOSTIC AND THERAPEUTIC APPROACHES IN LYMPHOEDEMA OF THE ELDERLY: ROLE OF THE PRO-BNP IN THE MODULATION OF TREATMENT

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Introduction: The diagnosis of Lymphedema in elderly patients very often requires numerous specific analyzes. Excluding the cases of sure diagnosis of primary lymphedema (which normally dates back to 'decades') and secondary lymphedema which, given from the moment of identification of the origin of pathology, in the other forms must be considered, on the one hand, the systemic aspects that can generate the clinical picture (first of all diastolic dysfunction of I, II and III degree) and, on the other hand, the local aspects of inactivity of the muscular pumps of the lower limbs linked to disabling orthopedic and / or neurological pathologies.

Aim: The inability of an adequate response to the 'pre-load' by the heart, often is added, in these cases, to a further difficulty of peripheral lymphatic transport. The physical treatment, in these conditions, can trigger acute crisis of 'heart failure' if the intensity of the same is not 'calibrated' on the heart compliance. Until recently, in this sense, an important predictive significance was attributed to cardiac ejection fraction (calculated during echocolor Doppler exam); actually the real indicative factor of the cardiac compliance is the PRO-BNP, the value of which is indicative both from the functional point of view of the heart (with consequent indications for treatment with diuretic drugs and other drugs) and for the indications to physical treatment.

Method: In our experience on 136 patients (aged between 66 and 87 years, mean age 73) who presented bilateral edema of the lower limbs with a negative history of primary or secondary forms of lymphedema, who had been requested among the examinations echocardiocolor Doppler with detection of the ejection fraction (EF) and the PRO-BNP dosage, an important dissociation was highlighted between the value of the EF and that of the PRO-BNP itself.

Results: Abnormalities in EF values were observed in 15.5% in comparison to the considered normal values. The PRO-BNP values, on the contrary, appeared altered in 84.2% of the subjects examined. During the physical treatment of EF values remained essentially unchanged while the PRO-BNP rose up during the first sessions of about 45% (12-115%) to return to normal values at the end of treatment in 79% of subjects with baseline alterations.

Conclusions: The study shows the importance of the recognition of the PRO-BNP value in diagnostic and in the monitoring of the physical treatment in patients with bilateral lower extremity edema due to central and peripheral vascular problems

[22] EXPLORING THE EXPERIENCES OF PATIENTS WITH PRIMARY AND SECONDARY NON-CANCER RELATED LOWER LIMB LYMPHOEDEMA AND THE IMPACT ON THEIR LIVES

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Introduction: Lymphoedema is an incurable, progressive condition, which results in the swelling of a limb or limbs and impairs mobility and joint movement. The psychosocial impact of lower limb lymphoedema is also devastating. The area of lower limb, non-cancer related, lymphoedema is poorly resourced and poorly researched, thus the focus of this research study.

Aim:

- To evaluate the impact of CDT on limb volume and quality of life.
- To explore the patients reported experience of living with lower limb lymphoedema and CDT.
- To examine the patients reported maintenance regimen of self care.

Method: A mixed method approach is utilized to explore the research question in a sample size of 20 patients.

Results:

- For all participants, mean QoL score at baseline was 4.3 (SD: 2.4) and improving statistically to 8 (SD: 1.5) at week 8 (MD 4.00, 95% CI 2.76 to 5.24); p=0.00001).
- Limb volume measurements demonstrated reduction of oedema over the intensive phase of treatment. Fluctuations in limb volume were seen over the maintenance period of 4 months.

Thematic analysis identified:

- Financial impact of lymphoedema
- Under diagnosis of the condition
- Lack of resources for treatment

Conclusions:

- Lower limb lymphoedema is a chronic condition that impacts negatively on QoL. CDT reduces oedema, further, QoL improves corresponding with reduction in limb volume and conversely deteriorates with an increase in limb volume.
- Adherence to the self-care programme was influenced by the visual experience of seeing the limb reduce in size volume.

[23] COMPRESSION IN UNSUAL EDEMA LOCALISATION

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Introduction: Lymphedema (LE) of the face, neck, thorax and genital is a challenge for the practicing therapist, especially in contrast to treatment of extremity lymphedema. Substantial demands are made of the therapist, and the available tools are limited. With genital lymphedema, patient compliance is a problem. As operative procedures for breast cancer are trending more to lumpectomy with sentinel lymph node biopsy, the incidence of arm lymphedema is lower, due to changing of operation method to sentinel lymphnode dissection. This is the reason why the incidence of arm lymphedema is reduced but the number of thoracal edema is rising.

Aim: Compression possibilities in face, thorax, genital and gigantic edema

Method: Using of Lymptape and adjustable Velcro devices

Results:

Head and neck LE

As the compression in head and neck LE is not only a challenge but a change in quality of life for the patient, we do the Lymptape in those cases. We studied the flow along the tape and were able to show with ICG, that there is a flow along the tape. In some cases the patients are wearing a compression mask during night.

Truncal LE

Our solution is a lymptape after skin care and MLD. In phase 2 the phase of maintenance the patient is wearing a compression body CCI 1.

Genital lymphedema

In both phases the compression is the main problem in monstreous genital edema. Those cases are rising due to obesity. In most cases the patients come for inpatient treatment. As there was always the problem with the bandages, which were slipping down, difficulties going to the toilet and applying again, we changed to readjustable velcro devices for easier living.

Unusual gigantic edema

In most cases two therapists have to do the MLD and compression was a trial for every day till we started with Velcro device reduction. From that point we were able to make a compression in different shapes of the extremity and readjust it as often as it was necessary. Step tstep with reduction of the edema we fitted the device for the necessary circumference.

Conclusions: Because of these challenges, treatment methods especially the compression which is the cornerstone has to be adapted. In severe cases of lymphedema, both inpatient therapy and new methods of treatment are recommended. Appropriate aftercare is of paramount importance, including helping the patient deal with the challenges met in everyday life.

[24] VALUE AND LIMITS OF THE ELASTIC BANDAGE AND THE ELASTIC GARMENT IN LYMPHOEDEMA AND LIPEDEMA: DIFFERENT THERAPEUTIC APPROACHES FOR DIFFERENT OBJECTIVES

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Introduction: If the decongestive physical treatment (manual lymphatic drainage, sequential pressotherapy, multilayer bandaging and kinesitherapy under bandage) performed in patients with Lymphedema remains, today, the essential therapeutic aid, regardless of the medical and / or surgical therapy possibly undergone by the patient, in Lipedema patients doubts remain about the actual protocols useful to patients.

Aim: Pain is not present (except in case of lymphangitic complication) in Lymphedema; instead, it is a clinical symptom present in over 80% of patients Lipedema patients examined. The study aims to verify the effects of elastic compression and the use of elastic garments in Lymphedema and Lipedema

Method: physical therapy aims to reduce, more or less considerably, the volume and consistency of the anatomical area concerned, as well as to prevent lymphangitic complications, through the 'displacement' of free fluids in the tissue spaces and the reduction of the local fibrotic component; in Lipedema, the classic physical treatment is not sufficient to 'decongest' the tissues precisely because the volumetric increase is essentially represented by the presence of fat cells. In this second condition, the physical means must have an effect directly on the cells (radio frequency 20-40 Khz, radial shock waves at 2.5 atmospheres).

The same definitive elastic garment in Lymphedema assumes the function of maintaining and consolidating the clinical results obtained with the physical treatment of attack, in Lipedema, vice versa, it has the function of containing the progression of the disease and, above all, of the remission of painful symptoms that in some cases occur in a particularly incisive manner.

Results: After a cycle of multilayer bandaging and subsequent wear, for at least 15 consecutive days in a daily manner, of the I or II class flat weave elastic garment (as for Lymphoedema) (Tights or Leggings) in 115 patients with Lipedema it was detected an average decrease in pain perception by the Numerical Rating Scale (NRS) of 75% (with a range between 49% and 100%).

Conclusions: Compression therapy therefore has a rationale in both forms of edema but the objectives it sets, with the same materials and techniques used, are differentiated according to the specific etiology of the two morbid forms.

[25] COMPARISON OF COBAN AND COFLEX TWO-LAYER COMPRESSION BANDAGES FOR THE TREATMENT OF LYMPHEDEMA - PRESSURE CURVES AND COMFORT

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Introduction: Lymphedema treatment, based upon international guidelines, consists out of four main pillars: manual lymphatic drainage, compression bandaging/compression garments, skin care and exercise therapy. The focus of the this study was compression bandaging, which is the cornerstone for edema volume reduction.

Aim: The aim of this prospective comparative cohort study was to examine both Coban as well as Coflex's two-layer compression bandages for the treatment of lymphedema. The assessed outcomes are pressure curves for 48h, stiffness (both static as dynamic), and comfort. Both systems are compared to the gold standard being short-stretch compression bandages.

Method: Coban and CoFlex were applied to the lower limbs of 12 healthy participants. Every participant wore both systems simultaneously (1 system/leg) for at least 48h. Sub-bandage pressures were assessed at two different heights (10 and 25 cm above the inner ankle) with the PicoPress at different measuring intervals over a time span of 48 hours. The ICC-compression questionnaire was filled out to assess the comfort regarding the bandages. A second appointment was made to apply the short-stretch bandage. Sub-bandage pressures were assessed over a time span of 2 hours.

Results: A significant difference ($p < 0,05$) was found in pressures between Coban and CoFlex, with Coban exerting the highest pressure. After 48h, both bandages still had a high enough pressure compared to the recommended pressures for edema treatment. Concerning the stiffness of the three different systems, no differences were found at baseline between the 3 types of bandages. All systems had an excellent stiffness. However, no significant decrease in stiffness values for the Coban bandage system was found, while a significant decrease after one hour of the CoFlex bandage system was found. Concerning comfort, no significant differences were found between Coban and Coflex compression systems.

Conclusions: A significant decrease of pressure could be seen for both bandages over time. However, pressures after 48h were still effectively high for lymphedema treatment. Coflex exerts lower pressure in comparison to Coban. No differences in comfort were found in this group of healthy volunteers.

[26] OPTIMIZING COMPRESSION BANDAGING IN LOWER LIMB EDEMA? - A NEW DEVICE TO MONITOR THE EFFECT OF COMPRESSION BANDAGING

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Introduction: Chronic edema in the lower limbs is a debilitating condition. If left untreated, the subcutaneous tissue may become fibrotic and the risk of cellulitis and wound are increased(1,2). Chronic edema can be reduced by compression bandaging. Application of compression bandages is a specialist job and requires skilled health care professionals(3). Bandages must be applied with a graduated pressure from ankle to knee or thigh to stimulate the venous and lymphatic flow from the lower limbs.

Aim: To test a new device (CIMON) under compression bandages, which can support health care professionals with information about effectiveness of the bandages and improve timing of change of bandages.

Method: The study aims to recruit 40 participants. Participants will be recruited among patients referred to compression bandaging due to chronic edema in the lower limbs at 2 outpatient clinics at Copenhagen University hospital Bispebjerg and Herlev Gentofte. Patients with chronic edema caused by venous insufficiency or patients with lymphedema are eligible if circumference at the widest circumference of the calf is > 35 and <70 centimeters. Patients with severe neuropathy, arterial insufficiency, dysregulated diabetes or pregnancy are not eligible. Patients with severe skin problems, skin infections or wounds directly at the widest circumference of the calf will not be invited.

The device (CIMON) is a circular stretch-band with a sensor attached, which is placed at the widest circumference of the lower leg over a tubular gauze to avoid irritation of the skin. The device registers stretch of the circular band, temperature, position of the leg and movement. Data from the device will be transferred by Bluetooth technology from an app on a smartphone to a secured cloud-based server. After application of the device, relevant wound care materials and compression bandages will be applied as usual practice.

Data on volume reduction, compression material and number of bandaging sessions will be collected. Safety and adverse events will also be evaluated.

Results: At present, data collection is ongoing. Results will be presented at the ILF conference.

Conclusions:

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[27] PREVENTING LOWER LIMB CELLULITIS THROUGH COMPRESSION THERAPY: RESULTS OF A RANDOMISED CONTROLLED TRIAL

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Introduction: Chronic oedema is a strong risk factor for lower limb cellulitis, and for cellulitis recurrence.^{1,2} Expert consensus recommends compression therapy to prevent cellulitis recurrence in individuals with chronic oedema,² however there is little supporting evidence.

Aim: To determine if compression therapy can prevent recurrence of lower limb cellulitis in patients with chronic oedema.

Method: A randomised controlled trial with cross-over was conducted involving participants with lower limb chronic oedema and recurrent cellulitis. Using concealed allocation, 84 participants were randomised into the intervention (compression) or control (no compression) group, with six monthly follow up planned for up to three years or until 45 episodes of cellulitis occurred. Following an episode of recurrent cellulitis, control group participants crossed over to the intervention group. The main outcome measure was time to onset of cellulitis. A planned interim analysis was performed by an external statistician following 23 episodes of cellulitis, resulting in early cessation of the trial.

Results: After 23 episodes of cellulitis, a log-rank test showed a highly significant ($p=0.001$) group difference in favour of the intervention group. In the control group, 40% (17/43) of participants experienced recurrence, compared to 15% (6/41) of intervention group participants, giving a number needed to treat of 4 [95% CI 2 to 15]. Based on time to recurrence, the hazard ratio was 0.23 (95% CI, 0.09 to 0.59), showing a 77% decrease in recurrent cellulitis risk for the intervention group compared to the control group.

Conclusions: In patients with chronic oedema and recurrent cellulitis, compression therapy is effective in preventing cellulitis recurrence. Provision of compression therapy should become standard practice for patients with lower limb chronic oedema and cellulitis. Translation of this evidence into practice could reduce the burden of cellulitis for sufferers and healthcare systems around the world.

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[28] GENITAL EDEMA EDUCATION NEEDS IN THE USA: A MIXED METHOD INVESTIGATION.

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Introduction: Genital edema (GE) is of unknown incidence in the USA but accounts for a small portion of most lymphedema therapist's case load. Patient and physician awareness of treatment availability and the healthcare payment model are two of several factors thought to influence a patient's access to care. Lymphedema therapists' confidence in their knowledge for managing GE and their exact education needs are unknown.

Aim: The investigation was part of an international project to understand the educational needs of lymphedema healthcare professionals caring for patients with GE, the factors influencing need and how it might be met. This report relates findings in relation to USA participants.

Method: This mixed method investigation used an online survey, distributed through national and international professional lymphoedema groups, followed by a face-to-face focus group in south-eastern USA.

Results: The online survey had 89 USA-based healthcare professional respondents (56 Physical Therapists, 28 Occupational Therapists and 5 others). Two-thirds had over 5 years' experience in lymphedema and most were female. 70% currently treat GE but the focus group clarified it is usually only a fraction of the case load. Significantly, only 1% felt identification and referral to services was prompt. Most did not use GE specific assessment tools.

Additional education on GE is needed after Lymphedema Certification (CLT) according to 93%. Very few were trained to pediatric GE. Despite a high level of confidence in knowledge of compression garments and the majority rating it 'essential', it remained the subject of highest individual need. An issue confounded by problematic access to suitable garments, explained the focus group. Lowest confidence was in: electrotherapy, physician interventions and legal, ethical and psychosocial concerns.

Over two-third of respondents suggested addressing education needs via e-learning packages and videos from experts. Almost as high was the preference for leaflets, booklets, handouts and educational videos for patients. Collaborative events with Pelvic Health specialists were identified as good education opportunities by over 50% of USA respondents. The focus group provided useful insight of the influence of the payment model on access to treatment for patients and how this influenced the education need of the attending therapist.

Conclusions: The need for additional education in management of GE was identified by the responding USA healthcare professionals. Although influenced by wider factors such as the payer model and patient and physician awareness, there is opportunity to address the needs through improved online education resources and collaborative learning.

[29] FEMALE GENITAL OEDEMA (FGO) RECOGNISING INCIDENCE AND EARLY IDENTIFICATION, LEADING TO INCREASED AWARENESS AND EARLY TREATMENT.

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Introduction: Female genital oedema has been overlooked and under-discussed for too long. Lymphoedema therapists still have a fear and lack of confidence in discussing and carrying out treatment. The use of ICG imaging allows for visualisation of labia and perineal oedema, meaning that the incidence of this problem can no longer be overlooked or hidden. As more lower limb patients have attended for ICG imaging, the real size of the problem is identified with an incidence of labia and perineal oedema of 61% in secondary and 38% primary lymphoedema.

Aim:

- To highlight the incidence of female genital oedema and its impact on lifestyle.
- To increase patient information and early treatment.
- To improve ongoing education of therapists, ensuring confidence and improved patient quality of life.

Method: As part of routine assessment, patients were asked prior ICG imaging if they considered they had FGO. The symptoms experienced and its effect on lifestyle, intimacy, sexuality and health were discussed. Confirmation of FGO, was confirmed or informed of, though ICG imaging at appointment. Unique imaging protocols were followed to ensure the greatest possibility to visualize FGO. Responses were collated, images taken during ICG mapping, reported and informed to patients. Solution for management were discussed and implemented where possible.

Results: Results demonstrate that the incidence of genital oedema is higher than previously documented. The outcomes of analysis of our assessments is 61% in secondary lymphoedema and 38% primary lymphoedema. ICG will collect in all areas of the genitalia and mons pubis and is identified to the perineum. Location appears to be dependent on surgical technique, radiotherapy dose and type, and lymphatic status. Currently the early identification of genital oedema is only available through ICG imaging. This demonstrates the need for early assessment and increased imaging.

Conclusions: It is important to drive a change through education and awareness of FGO, to HCP including lymphoedema therapists and medics regarding identification and early intervention, ensuring equity of treatment to sufferers similar to that of breast oedema in breast cancer survivors. Information gained through routine assessment allows for a drive to change practice for early intervention, recognition ultimately improving quality of life.

[30] PELVIC LYMPH NODE QUANTITATIVE STUDY

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Introduction: Lymphedema commonly occurs secondarily to cancer interventions, including the surgical removal of lymph nodes (LN). Previous findings from authors such as, Földi, Standring, Moore, Hsu, and Itkin, indicate there are 500-800 LNs in the lymphatic system of the body, with 41-154 in the pelvic region. Deciding how many LN to remove and predicting possible severity of damage can become problematic when the range of LN in an area can vary by 30 LNs

Aim: The purpose of this study was to investigate more precise ranges of pelvic LNs within cadaver samples to provide reference for future surgical procedures and treatment of lymphedema.

Method: Quantification of LNs for number occurred on cadavers simultaneous with Doctor of Osteopathic, Physical Therapy, and Physician Assistant students' dissections. Demographics of the cadavers were 27 female, 16 male, 39 Caucasian, 3 African American, 1 Asian, with an age range of 42-102 and a mean of 70. Anatomical landmarks were referenced to identify and label the LNs. Cadavers (N=43) inspected for lumbar LNs and cadavers (N=86 sides) inspected for sacral, common, deep and superficial inguinal, and internal and external iliac LNs. Regions not meeting a set minimum due to previous medical interventions or overzealous students were removed from statistics.

Results: Quantitative analysis of the pelvic region LNs revealed a power analysis value of 0.733 with 43 cadaver sample size (unpaired LN regions) and a value of 0.954 with a 86 cadaver sample size (paired LN regions). Analysis of LNs in unpaired lumbar region revealed the true mean of the LNs lies between 20-28 [CI=95] while previous data shows LN quantity ranging from 20-50. The true mean of LNs in paired regions lies between [CI=95] from 6-10 (numerical range 5-30) for the common iliac, 2-3 (numerical range 2-3) for the sacral, 5-7 (numerical range 4-18) for the internal iliac, 10-13 (numerical range 5-25) for the external iliac, 2-4 (numerical range 1-3) for the deep inguinal, and 9-12 (numerical range 4-25) for the superficial inguinal.

Conclusions: Reduced ranges of LNs per region were found in every region except the common iliac and deep inguinal regions. The results from the study could be referenced by a surgeon to create a more precise management plan when deciding the number of LNs to remove for diagnosis and treatment of cancer. This can also aid lymphedema therapists in anticipating the level of risk for a patient post cancer interventions and expectant outcomes with actual lymphedema treatment.

[31] SELF-REPORTED KNOWLEDGE, SKILL LEVEL, AND CONFIDENCE ON EVALUATING AND TREATING GENITAL LYMPHEDEMA AMONG MEDICAL PRACTITIONERS

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Introduction: Generally introductory lymphedema training courses involve a significant portion of hands-on laboratory practice in manual lymphatic drainage (MLD) and bandaging techniques. This is to enhance the learners understanding of the concepts and practice the technical skills on fellow participants to improve on the skill and confidence prior to actual patient treatments. Often, training is focused on upper and lower extremity lymphedema. The areas of head/neck and genital are mentioned; yet, vary in the scope of information disseminated. Socio-cultural taboos prevail regarding genital and sexual health and thus limiting group discussion. These beliefs and the paucity of comprehensive hands-on training can impede the successful treatment of genital lymphedema. One training program initiated the use of donning cloth models of enlarged genitals\ia to allow practitioners to learn and practice evaluation, MLD, and bandaging techniques in a lab setting to enhance their skills and confidence with the diagnosis of genital lymphedema.

Aim: This study has two aims: 1) to evaluate the effect of three different instruction methods on practitioner knowledge and skill acquisition regarding genital lymphoma cross introductory and advanced courses and, 2: to evaluate the perception and confidence levels of the same practitioners in treating genital lymphedema. The instruction method include: in-person instruction without hands-on laboratory component, virtual, and in-person with a hands-on laboratory component.

Method: A survey was presented to international practitioners demonstrating an interest in genital lymphedema. The survey assessed when training on genital lymphedema occurred (initial and/or advanced), the type of training the practitioners received (no hands-on laboratory training, virtual, and/or hands-on laboratory training), and the self-reported confidence level of the practitioners in treating genital lymphedema. The surveys were sent to all practitioners that downloaded genital lymphedema quality of life assessment tools, those that attended advanced genital courses (virtual and/or hands-on with laboratory), and those attending a hands-on conference associated lab.

Results: The results are still pending.... I will have them by the time of the conference.

Conclusions: This will be completed by the time of the conference.

[32] FUNCTIONAL LYMPHATIC RESERVE CAPACITY IS DEPRESSED IN PATIENTS WITH A FONTAN CIRCULATION

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Introduction:

It is recognized that lymphatic abnormalities play a role in complications, where effusions are seen in patients with a Fontan circulation. Recent results disclosed that the contraction frequency of lymphatic vessels is higher in Fontan patients compared to healthy controls, during rest. It is proposed that the elevated lymphatic contraction frequency seen in the Fontan patients is necessary to maintain the same interstitial fluid balance as seen in healthy controls. Hyperthermia have previously been used as a stress test to increase lymphatic contraction frequency and indirectly disclose the reserve capacity of the lymphatic vessels ability to contract in healthy subjects. So far it is not known how the lymphatic vessels in Fontan patients will react to an acute increased workload.

Aim: We aimed to investigate how the lymphatic vessels in Fontan patients will react to an acute increased workload compared to healthy controls.

Method: The study population was Fontan patients followed at The Heart Institute of São Paulo and Hospital das Clinicas Ribeirão Preto, Brazil. These were matched with healthy controls from Sao Paolo in Brazil. The functional state of the superficial lymphatic vessels in the lower leg was investigated, using NIRF imaging. The baseline contraction frequency was measured during rest in a supine position. Hyperthermia was induced by submerging the lower leg in a tank with water heated to 37-40 °C for 5 minutes before measuring the contraction frequency again in a supine position.

Results: Baseline values found in the Fontan patients showed a 57% higher contraction frequency ($0.4 \pm 0.3 \text{ min}^{-1}$) compared to the healthy controls ($0.3 \pm 0.2 \text{ min}^{-1}$), ($p=0.0445$). After inducing stress on the lymphatic vessels with hyperthermia the ability to increase contraction frequency was decreased in the Fontan patients compared to the control group ($0.6 \pm 0.5 \text{ min}^{-1}$ vs $1.2 \pm 0.8 \text{ min}^{-1}$, $p=0.0102$). Furthermore, the ability to filtrate fluid into interstitial space from the capillaries was decreased in the Fontan patients compared to the healthy controls, ($p=0.0073$). Finally, levels of norepinephrine in the blood was increased by 65 % in the Fontan patients compared to the controls ($p=0.0464$).

Conclusions: In this study, we revealed that the functional lymphatic reserve capacity is depressed in the Fontan patients. Suggesting, a limit of functional lymphatic reserve capacity, when reached, a compensatory raise in contraction frequency to maintain interstitial fluid balance, is deficient. This could explain why some Fontan patients develop late-onset complications with effusions such as lymphedema.

[33] GRAVITY AND LYMPHODYNAMICS

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Introduction: The lymphatic system is compromised in Fontan patients. Using Near Infrared Fluorescence (NIRF) imaging on peripheral lymphatic vasculature, we have demonstrated that not only the Fontan circulation but also external factors such as; exercise, hyperthermia and pharmacological mediators impact on lymphatic function.

Aim: In this study we have studied the impact of the ever-present external factor on the lymphatic system: gravity.

Method: Healthy volunteers (N=17, 11 males, age 28.1 +/- 2.6 years) were included. We used NIRF imaging to investigate lymph rate, velocity, and pressure. Sequence 1 – 3 examined lymph rate and velocity. Sequence 4 + 5 examined lymph pressure. Raw data analysis was performed using a custom written Labview program. All sequences were analyzed by two observers and interclass correlation scores were calculated.

Results: The lymph rate at baseline (sequence 1) was 0.5 ± 0.2 /min and rose significantly during upright posture (sequence 2) and remained significantly higher than the baseline lymph rate after lying down again (sequence 3)

The lymph velocity was 1.5 ± 0.4 cm/s and changed during standing (p-value = 0.01), however all pairwise comparisons were insignificant. Lymph Pressure was significantly higher while standing by (9 mmHg, CI: 2 – 15 mmHg).

Conclusions: The lymphatic system responds rapidly to the change in posture by increasing lymph rate and pressure.

[34] DERMAL BACKFLOW, DETECTED BY NEAR-INFRARED FLUORESCENCE LYMPHATIC IMAGING, IS A VERY ACCURATE EARLY PROGNOSTIC OF BREAST CANCER-RELATED LYMPHEDEMA DEVELOPMENT

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Introduction: The earlier lymphedema (LE) is treated, with complete decongestive therapy (CDT) and/or reparative lymphatic microsurgeries, the better the outcomes. Identifying cancer survivors at risk for LE could direct early treatment, and avoid needless treatment for those not at risk. There is increasing evidence that lymphedema exists in a “latent” form, before obvious swelling appears. Near-infrared fluorescence lymphatic imaging (NIRF-LI) can provide “see through the skin” images and movies of lymphatic vessel anatomy and pumping. We hypothesized that NIRF-LI surveillance of breast cancer patients throughout cancer treatment could provide the earliest detection of breast cancer-related lymphedema (BCRL), before irreversible arm volume and skin changes set in.

Aim: To determine if NIRF-LI could be used to identify latent, developing BCRL at the earliest time point, before overt arm swelling ($\geq 5\%$ Relative Volume Change, RVC) appears.

Method: In a prospective, ongoing, longitudinal clinical study (NCT02949726) of 80 breast cancer patients undergoing neoadjuvant chemotherapy, axillary lymph node dissection (ALND) with mastectomy or breast-conserving surgery, and radiation treatment (RT), we used perometer readings and NIRF-LI to observe changes in arm lymphatics and volume. Perometry measurements and NIRF-LI imaging were first conducted before ALND, and then were repeated at 4 weeks post-ALND, and at 6, 12, and 18 months post-RT.

Results: 20 of the first 40 study subjects developed BCRL, defined as $\geq 5\%$ arm swelling. We observed that early lymphatic dysfunction or “dermal backflow” in the arms of these breast cancer patients occurred on average 6 months but up to 19.5 months prior to arm swelling. Dermal backflow appears as a cloud-like mass where normally, linear, pulsing lymphatic vessels are seen. Backflow most likely represents retrograde flow to the skin lymphatics from larger vessels. The presence of dermal backflow had a 100% positive predictive value (PPV) for BCRL (i.e., no false positives), a specificity of 100% (95% CI: 63.06 – 100%), sensitivity of 95.65% (95% CI 78.05 – 99.89%), and an accuracy of 96.77% (95% CI 83.30 – 99.92%).

Conclusions: Studies by others have shown that early treatment can reverse or stall the development of fluid retention and skin changes of LE, but prophylactically treating every cancer patient would be prohibitively expensive. We have identified an imaging biomarker with a 100% PPV that can identify those at risk, enabling early treatment. Using NIRF-LI surveillance of breast cancer survivors before arm swelling is evident could vastly improve quality of life and reduce health care costs for this patient population.

[35] LYMPHOEDEMA INTERNATIONAL HEALTH AND DEVELOPMENT AWARENESS (LIHDA): PROVISION OF COMPRESSION GARMENTS AID AND EDUCATION IN DEVELOPING COUNTRIES

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Introduction: Lymphoedema International Health and Development Awareness (LIHDA) is a non-profit organisation providing patients, practitioners and healthcare organizations in developing countries with access to educational, operational and material resources at no cost. In the past five years, LIHDA has overcome many challenges by promoting, supplying and supporting recognition in the importance of lymphoedema awareness and evolving better healthcare standards worldwide.

Aim: Our mission statement is to empower practitioners to develop and deliver effective management of lymphoedema for low-income patients in developing countries and to enable the integration of international standards and educational research and materials.

Method: Practitioners in developing countries wish to improve lymphoedema treatment but lack essential resources, specialist education or support. LIHDA sought to establish infrastructures to ensure both deliveries of donations and education, ensuring their appropriate use.

Results: Activity monitoring shows LIHDA has provided approximately 5.710 out-of-date (in very good and sanitized conditions) assistive products in compression garments aid to eleven countries in need. Ongoing training has been held in seven developing countries, with nine shipments to five other developing countries in 2019 and the beginning of 2020. Facilitated by the British Lymphology Society's promotion of LIHDA's program, encouraging recycling out of date garments by specialists across the UK and Europe. So far LIHDA has received donations from 27 lymphoedema clinics, six manufacturers of medical devices, and numerous independent lymphoedema practitioners, patients, and their family members. A pilot assimilation project with Montenegro's Chamber of Physiotherapists, Ministry of Education and Ministry of Health demonstrates collaboration accomplishment in the implementation of standards in the management of lymphoedema on a national level.

Conclusions: Through continuous improvement in international collaboration LIHDA established key partnerships with healthcare and educational institutions. It provides practical workshops for health professionals, advocating early recognition and treatment of lymphoedema on many levels, promoting international standards of practice and education. It collects assistive products destined for disposal in developed countries, shipping them to health organizations with low-income patients in developing countries. Recipient reports demonstrate success in raising awareness of healthcare professionals, patient groups and healthcare regulators, improving patient quality of life and empowering practitioners.

[36] STANDARD OF CARE FOR LIPEDEMA IN THE UNITED STATES

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Introduction: Lipedema is a loose connective tissue disease predominantly in women identified by increased nodular and fibrotic adipose tissue on the buttocks, hips and limbs that develops at times of hormone, weight and shape change including puberty, pregnancy, and menopause. Lipedema tissue may be very painful and can severely impair mobility. Non-lipedema obesity, lymphedema, venous disease, and hypermobile joints are comorbidities. Lipedema tissue is difficult to reduce by diet, exercise, or bariatric surgery. While there are standard of care documents for lipedema in other countries, and lipedema was described in 1940 in the United States (US) to date there has not been a standard of care document published in the US.

Aim: To share the consensus guideline on lipedema written by a US committee.

Method: Consensus was reached following the Delphi Method. Consensus statements were rated for strength using the GRADE system.

Results: Eighty-five consensus statements outline lipedema pathophysiology, and medical, surgical, vascular, and other therapeutic recommendations. Future research topics are suggested.

Conclusions: These guidelines improve the understanding of the loose connective tissue disease, lipedema, to advance our understanding towards early diagnosis, treatments, and ultimately a cure for affected individuals.

[37] EVALUATION OF DEPRESSION AND QUALITY OF LIFE IN PATIENTS WITH LIPEDEMA

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Introduction: Lipedema presents itself with the swelling and widening of the lower extremities. It is characterized with abnormal increase of subcutaneous fat tissue. The lack of recognition of lipedema disease and the shame of patients from this accumulation of fat negatively affects quality of life and mental health.

Aim: The aim of this study is to determine the levels of depression in patients with lipedema and to determine how lipedema affects quality of life.

Method: Our research was planned as a cross-sectional clinical trial. 107 patients who admitted to T.C. Health Sciences University Istanbul Physical Therapy and Rehabilitation Training and Research Hospital lymphedema unit and were diagnosed with lipedema and 107 healthy adult individuals taken as a control group were evaluated. Anamnesis and clinical findings of patients with lipedema were recorded. Both groups were given sociodemographic form, the EQ-5D overall quality of life scale and the Beck depression scale.

Results: In patients with lipedema, the average age of onset was determined to be 31.1±14.9 and the average diagnostic age was determined to be 48.4±13.3. The mean age of the patient group was 49.0 ± 13.0, and the mean age of the control group was 48.1 ± 13.4. There was no significant difference between the two groups in terms of mean age. (P>0.05) In patients with lipedema, the EQ-5D overall quality of life scale has been shown to be lower. (P<0.05) Complaints about mobility, daily life activities, pain/discomfort and depression/anxiety, which are questioned in the overall quality of life scale of EQ-5D, have been found more in patients with lipedema. (P<0.05) EQ-5D VAS score was found to be lower in patients with lipedema than control group. (P<0.05) Positive correlation was detected between mobility, self-care, daily life activities, anxiety/depression and pain/discomfort subscales and lipedema phase. (P<0.05) As the lipedema phase increased, the EQ-5D index score and EQ-5D VAS score decreased. (P<0.05) Beck depression scores were higher in lipedema patients. (P<0.05) As the lipedema phase increased, Beck's depression scores were observed to increase. (P<0.05)

Conclusions: In lipedema patients, depression is common. The quality of life of patients with lipedema is low. The diagnosis of lipedema is often delayed. In this process, patients can be complicated by various mental health problems. With early diagnosis and psychiatric counseling, these problems may be avoided.

[38] LYQLI FOR ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH LIPOEDEMA PRE AND POST LIPOSUCTION: 1 YEAR FOLLOW UP

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Introduction: Lipoedema has a significant negative impact on health-related quality of life (QOL)¹. There are no validated questionnaires to assess health-related QOL for lipoedema patients. The Lymphoedema Quality of Life Inventory (LyQLI) is a validated questionnaire for use in lymphoedema, which has been utilised in studies to assess the effectiveness of treatment in lymphoedema, including post liposuction^{2,3}.

Aim: The aim of this study was to assess the QOL in lipoedema patients following liposuction over 12 months. This study also aimed to demonstrate the role of LyQLI for assessment of health-related QOL in lipoedema patients.

Method: This was a prospective study assessing QOL of patients with lipoedema who underwent liposuction. The LyQLI questionnaire was provided to patients pre-operatively and at 3, 6 and 12 months post-operatively. QOL questionnaires form standard practice for patients undergoing liposuction for lipoedema in our centre, therefore ethical approval was not required for this study. Data was organised into the three pre-set domains: physical, psychosocial and practical. A median score for each domain was calculated.

Results: Overall health-related QOL improved across all domains. At 3, 6 and 12 month questionnaires there was a statistically significant reduction in the LyQLI score as compared to the pre-operative questionnaire (median 78) with median scores of 35 ($p=0.00002$), 18.5 ($p<0.00001$) and 21 ($p<0.00001$) respectively.

Conclusions: There is a sustained improvement in QOL post-liposuction. Given the limited literature available on health-related QOL there is certainly scope for further research in this area and development of a validated questionnaire specific to lipoedema.

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[39] THE CORRESPONDENCE BETWEEN THE LOCALIZATION OF PAIN AND THE FAT DISTRIBUTION TYPE I-V IN PATIENTS WITH LIPOEDEMA PART 1 OF THE RESULTS OF THE DUTCH LIPOEDEMA SURVEY

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Introduction: Lipoedema is a chronic condition involving the symmetric deposition of subcutaneous fat, that often affects the legs, hips and upper arms. The disproportional fat distribution and pain in these locations are both important symptoms and form the key-features for a complete medical diagnosis.

Aim: This cross-sectional study hypothesizes that the level of pain corresponds with the fat distributions in type I-V lipoedema. Additionally, the association between the level of pain, higher stage of lipoedema and higher amount of body fat were analysed. Providing more insight in the association between fat as a source of nociception and lipoedema pain, might lead to a better understanding of lipoedema related pain symptoms, appropriate pain strategies and create new or support current treatment options.

Method: A survey amongst the Dutch Lipoedema Network was conducted and a set of 17 questions were obtained and analysed. Respondents were asked to indicate type and stage of lipoedema based on given visualised options and pain intensity on Numeric Rating Scales 0-10 (NRS-11). Self-reported weight, height and waist circumference were used to calculate Body Mass Index and Waist Height Ratio.

Results: Overall agreement between the pain locations and the presence of fat was found to be 24%, representing a fair association ($\kappa=0.254$; $p<0.001$). The association between the severity of lipoedema and the level of minimal pain, maximal pain and mean pain was poor ($r=0.21$; $r=0.26$; $r=0.27$, respectively; $p<0.001$). The association between BMI and the level of minimal pain was poor ($r=0.20$; $p=0.001$) The association between BMI and maximal pain and mean pain was poor ($r=0.29$; $p<0.001$, $r=0.28$; $p<0.001$). All the Waist Height Ratio associations with pain were non-significant.

Conclusions: This study shows only fair agreement between the localisation of the pain and the fat distribution in lipoedema Type I-V.

[40] HUMAN THORACIC DUCT PRESSURE AND INTRINSIC CONTRACTIONS - IMPLICATIONS OF MECHANICAL VENTILATION

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Introduction: The fluid balance of the human body is a sensitive equilibrium. While the amount of fluid filtered from the blood vessels is determined by the Starling equation, the transport and removal of this fluid is maintained by active contracting lymphatic vessels. Ultimately, the thoracic duct is responsible for delivering the lymphatic fluid back into the blood circulation. This final return is thought to be a well-timed synergy between pressure changes in the thoracic duct during contraction and pressure changes in the central veins during respiration. However, little is known about the force and frequency of these thoracic duct contractions and it is unknown how the lympho-venous gradient responds to the positive intrathoracic pressure during mechanical ventilation.

Aim: In this study, we aimed to examine human thoracic duct contractions during mechanical ventilation and a brief period of breath-hold. We also retrospectively evaluated the relationship between ventilator settings and the lympho-venous gradient.

Method: The study examined 32 patients with severe congenital heart defects and venous congestion. The thoracic duct was cannulated for pressure measurements near the cisterna chyli using a transabdominal approach with a needle, a control wire, and a microcatheter. The venous pressure was measured in either the left subclavian vein or the superior vena cava. In seven patients the thoracic duct pressure was measured during both mechanical ventilation and a short period of breath-hold. In the remaining 25 patients, thoracic duct pressure and central venous pressure were assessed during mechanical ventilation to estimate the lympho-venous gradient and any relationship between this and the ventilator settings.

Results: The pressure of the thoracic duct was 15.9 ± 5 mmHg. The pressure correlated closely to the central venous pressure. Intrinsic contractions, mechanical ventilation, and arterial pulsations influenced the thoracic duct pressure. The contraction frequency of the thoracic duct was 4.8 min^{-1} (± 1.1) and it was able to generate an intrinsic force equivalent to an increase in pressure of 5.2 mmHg (± 4.5) during contraction. In this group of individuals with congenital heart defects and venous congestion, increasing the positive inspiratory pressure during mechanical ventilation correlated inversely with the lympho-venous gradient.

Conclusions: The intrinsic contractions of the thoracic duct generate a force equivalent to a 33% increase in pressure. This increase may play a significant role in the return of lymphatic fluid. Increasing positive inspiratory pressure led to a more unfavorable lympho-venous gradient and possibly reduced the return of lymphatic fluid.

[41] THE IMPORTANT ROLE OF PATIENT EDUCATION IN DEVELOPING SECONDARY LYMPHEDEMA AFTER BREAST CANCER AND GYNECOLOGIC CANCER SURGERY

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Introduction: Gynecologic cancers affect 17% of the female population worldwide and 14% of the population throughout Europe. According to the 2013 data of the Public Health Agency of Turkey, the most common type of cancer in women is breast cancer with a 24% incidence, followed by gynecologic [endometrial (10.1%), ovarian (5.9%), and cervical (4.2%)] cancers.

Aim: The aim of this study was to determine and compare the level of information and awareness in patients that developed lymphedema after surgery for breast cancer and gynecologic cancers and to investigate its effects on lymphedema development.

Method: Totally, 265 female patients with upper and lower extremity lymphedema, including 155 of them had history of gynecologic cancer surgery and remaining 110 had history of breast cancer surgery were evaluated for lymphedema education in their postoperative period. The demographic and clinical data as well as the characteristics of surgery and lymphedema were recorded. The patients were asked whether health professionals provided them with any information on lymphedema and how to reduce the risk of this condition after oncologic surgery.

Results: 24 survivors (21.81%) with breast cancer related lymphedema and 26 survivors (16.77%) with gynecologic cancer related lymphedema reported that they had received some information about lymphedema by health professionals. In breast cancer survivors, the time of diagnostic delay for lymphedema was shorter in the informed group than uninformed group ($p < 0.001$), and there was a higher rate of cellulite attacks in involved arms of uninformed patients ($p = 0.044$). The time from the gynecologic oncology surgery to the development of lymphedema was longer and the diagnostic delay for lymphedema was shorter in the informed group than uninformed group ($p = 0.042$, $p < 0.001$). There was a higher rate of cellulite history in the uninformed patients than uninformed patients underwent gynecologic oncologic surgery ($p = 0.037$). The time of diagnostic delay for lymphedema was shorter among the informed groups than uninformed groups among these female cancer survivors with both lower and upper quadrant lymphedema ($p = 0.043$).

Conclusions: The rate of previous education for awareness about lymphedema among patients with a history of surgery for gynecologic malignancies is lower compared to those for breast cancer. Informing patients about lymphedema after female cancers may lead to a later onset of lymphedema, lower lymphedema grades or mild cases, and fewer infection attacks in involved extremity. We have suggested the interdisciplinary cancer team working in early postoperative period because of importance early diagnosis and early treatment in female cancers.

[42] CLIMATE CHANGE AND CLIMATIC VARIATION IMPACT ON CHRONIC OEDEMAS: A SYSTEMATIC REVIEW

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Introduction: Chronic oedema is a significant problem worldwide and results in substantial burden on the health service as well as having a major impact on quality of life. It is primarily managed through ongoing use of compression garments, bandaging and manual lymphatic drainage. However higher temperatures and increased humidity result in additional discomfort through physiological changes which may lead to reduced compliance with core treatment recommendations resulting in increased swelling and poorly managed symptoms. Rising temperature as a result of climate change is well documented with scientists predicting a 1.5 – 2.5% increase in average temperature across the globe by 2050. It is anticipated that this will present significant challenges for the ongoing management of chronic oedema/lymphoedema and an increased risk of infection.

Aim: The objective of our study was to systematically review the literature for evidence about the impact climatic conditions on chronic oedema/lymphoedema.

Method: We included all studies that examined the general population (adult and/or children) who have chronic limb oedema as a result of primary or secondary lymphoedema, lipoedema, elephantiasis, vascular insufficiency, trauma or any other condition that results in an imbalance between lymphatic load, filtration and lymph transport

Exclusion criteria included articles that were not a primary study and studies published before 2000. Whilst lymphatic filariasis, a parasitic infection that is spread by mosquitos, and podoconiosis, mineral particle-induced inflammation caused by long-term exposure to red clay soils, are two conditions known to have direct links with environment, they were only included if the study discussed how the disease was influenced by climatic variations.

Results: 2489 studies were identified using our search criteria and then screened. 186 had full text screening with data extracted from 11 articles that met our aims. Articles fell into two broad categories: cellulitis and chronic oedema / lymphoedema.

Conclusions: The review showed cellulitis is a common complication of chronic oedema. Studies showed a clear increase in its presentation in warmer temperatures. Very few studies looked at climatic influences on symptoms of lymphoedema and those that did had mixed results. There is a distinct lack of qualitative evidence. Further research in this area is recommended.

[43] OCCUPATIONAL AND SOCIAL DEPRIVATIONS FOR INDIVIDUALS LIVING WITH LYMPHOEDEMA

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Introduction: Occupations are various activities individuals, groups, or populations engage in (American Occupational Therapy Association, 2014). One aspect of occupations is social participation. It is the interaction of activities to facilitate engagement with peers, family, and friends (Gillen & Boyt Schell, 2014). Occupational therapists are skilled in assisting clients to participate in occupations using a holistic approach.

Aim: The study aimed was to determine the occupational deprivations and social implications for individuals living with lymphedema.

Method: The qualitative study employed a phenomenological approach to conduct 14 semi-structured interviews. The research team independently coded each transcript, then came together to compare, discuss, and develop a preliminary code list and identify themes. For enhanced reliability, the researchers performed triangulation, analysis of themes, and developed an audit trail.

Results: Occupational Deprivations: Activities of Daily Living. The participants reported difficulty in completing daily self-care tasks such as bathing and sexual intimacy:

“Sometimes the pain overrides the pleasure, and it [pain] has affected [sexual intimacy] a great deal.”

Instrumental Activities of Daily Living (IADLs). The participant’s lymphedema impacted their ability to live independently in the community. Common IADLs impacted included shopping, driving, and housework: “Sadly, I do not anymore [shopping].”

Employment. The symptoms associated with lymphedema impacted participants’ job performance or ability to maintain employment. “I am not able to do the job that satisfies me, which means I am letting them [employer] down. I know I cannot work like I could.”

Social Implications: Friends. Living with lymphedema impacts an individual’s ability to participate with friends due to pain, stigma, or discomfort: “It is almost like people get scared that they do not want to [be friends]. They [friends] want to break away from you before something happens to you.”

Family. Challenges associated with participants included family members feeling a sense of embarrassment, the location of family gatherings were inaccessible, or the burden placed on families due to increased caring needs for the participant: “I missed out on family gatherings... Traveling and being in a car for a long period of time is not possible.”

Community. Social participation at a community level, including participants’ local neighborhoods and various organizations, is restricted. Limited accessibility and pain were common challenges. “Today, I wanted to get up and go to the gym and see people, but my legs have hurt so bad today. Right here in the bed is where I want to stay.”

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[44] COVID-19 AND LYMPHEDEMA PATIENTS: FIRST RESULTS AND CONCLUSIONS

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Introduction: CoViD-19 has affected people around the world, including people with lymphedema (LE), both primary and secondary (with oncological history as well). In the beginning it was not clear whether these patients should be considered as a high-risk group of getting CoViD-19 infection, whether vaccination should be considered and what is happening with lymphedema if a person is infected. The aim of the study was to answer these questions and to provide a guideline for lymphedema patients.

Aim:

Method: a systematic literature review using - PubMed, Medline, Cochrane, ALF, ILF, LE&RN, LSN, RUSSCO, ESMO, ASCO were analysed. A clinical analysis of local lymphedema (primary and secondary) patients (256) was performed, to find out the CoViD-19 morbidity rate, the mortality rate, the effects on lymphedema, the vaccination effects, while also compared to global and local statistics and to family members without lymphedema.

Results: The morbidity rate in lymphedema patients was similar to average rate in population, the mortality rate and severe course cases were lower than in population (0,39% vs 2%; 1,56% vs.6%). Lymphedema was not worsening during an infection if the person continued to follow regular LE recommendations. Vaccination was not causing severe side effects in lymphedema patients (unless there were other severe chronic conditions).

Conclusions: lymphedema was not a risk factor of CoViD-19 severe course or higher mortality risk. CoViD-19 is not a cause of lymphedema aggravation if person continues to follow recommendations. Lymphedema should not be a contraindication for vaccination, however the vaccine should be administered to a limb without lymphedema.

[45] IS DEBULKING SURGERY FOR LYMPHEDEMA COST-EFFECTIVE?

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Introduction: Lymphedema is a chronic, debilitating disease that has been described as the largest breast cancer survivorship burden. The standard of care is conservative management, which includes compression therapy and intensive physical therapy. Debulking surgery has been shown to improve extremity volume, improve patient quality of life and decrease the incidence of cellulitis in the literature. After debulking surgery, patients are well-maintained on compression therapy alone. This procedure is routinely covered in numerous other developed countries, yet it is still inconsistently covered in the United States.

Aim: This study is the first to employ rigorous methodological criteria to evaluate debulking surgery via power-assisted liposuction for the treatment of chronic lymphedema of the upper extremity from a cost-utility perspective.

Method: Extremity volumes from all patients who underwent debulking surgery of the upper extremity at two institutions between December 2017 and January 2020 with at least 12 months follow up were included. Procedural costs were calculated using Medicare reimbursement data. Average utility scores were obtained for each health state using a visual analog scale (VAS), then converted to quality-adjusted life years (QALYs). Because lifelong compression therapy is indicated for both groups, this cost was excluded from analysis. A decision tree was generated and incremental cost utility ratios (ICUR) were calculated. Sensitivity analyses were performed to evaluate our findings.

Results: Debulking surgery is associated with a higher clinical effectiveness (QALY) of 27.05 compared to conservative management (23.34), with a relative cost reduction of \$74,487. Rollback analysis favored debulking surgery as the cost-effective option compared to conservative management. The resulting negative ICUR of -20115.07 favored debulking surgery and indicated a dominant strategy.

Conclusions: Our study supports the use of debulking surgery for the treatment of chronic lymphedema of the upper extremity.

[46] EXPLORING THE EFFECTIVENESS OF LYMPHOEDEMA ASSESSMENT METHODS

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Introduction: There is no agreed universal method of Lymphoedema assessment, thus many differing approaches are used. Limited research has investigated which method is most effective. This Tenovus Cancer Care funded study is part one of three.

Aim: Determine which methods of lymphoedema measurement (Circumferential Tape Measure (CTM), Perometer, Bio-impedance and self-report questionnaire) is most accurate and clinically effective.

Method: A purposeful cohort of 84 adults with unilateral limb lymphoedema secondary to cancer were recruited. Ethical approval gained. Measurement data collected for each participant at one session included:

- 4cm CTM
- Perometer
- Bio-impedance (Bodystat Quadscan 4000)
- Bio-impedance (L-Dex® U400)

Statistical analysis included paired *t*-tests/Cronbach's Alpha/Pearson's correlation and ANOVA.

Results: Seventy-five people with upper and nine with lower limb lymphoedema were recruited with a mean age of 64 years. For the upper limb group, 80% had axillary node clearance (80%), whilst 67% had groin node dissection of the lower limb group. Concurrent validity between CTM and Perometer was very high; arms ($r=0.94$) and legs ($r=.93$). The intra-rater reliability of CTM ($ICC>0.97$; 95% CI) was higher than the perometer ($ICC>0.95$; 95% CI); all were statistically significant ($p<0.00$). The measurement with highest sensitivity and specificity was CTM at a threshold of 7.5% volume difference between limbs. There was little difference between the bio-impedance methods in terms of sensitivity and specificity.

Conclusions: CTM and perometry remain valid and reliable measures of limb volume assessment. Both types of bio-impedance had moderate sensitivity (66.7%) and specificity (78.6%) for detecting lymphoedema. None of the methods is inter-changeable.

[47] PATIENT REPORTED OUTCOME MEASURES FOLLOWING LIPOSUCTION FOR UPPER AND LOWER LIMB LYMPHOEDEMA

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Introduction: Chronic lymphoedema leads to irreversible fatty and fibrotic changes that do not reverse with continuous therapy (CCT) alone or lymphatic surgical procedures. Liposuction with CCT can reduce and maintain limb volumes however. The Lymphoedema Quality of Life Index (LyQLi) is a patient reported outcome measure designed to assess lymphoedema specific quality of life and can be used to evaluate the impact of treatments in this patient group.

Aim: To assess quality of life using the LyQLi in patients with upper or lower limb lymphoedema managed with liposuction and CCT and compare any differences between the two groups.

Method: Adult patients with unilateral ISL stage 2 or 3 lymphoedema of the upper or lower limb managed with liposuction and CCT were managed at a single centre by a single surgeon. LyQLi scores were obtained pre- and post-operatively at intervals of 4 weeks, 3 months, 6 months and 12 months post-op as part of standard treatment work up. The questionnaire was sub-divided into physical, practical and psychosocial domains for analysis. Limb volumes were measured using a truncated cone technique at each time point. Data was analysed using a generalised linear mixed model analysis with post-hoc analyses with Bonferroni correction.

Results: 45 patients underwent liposuction and CCT for lymphoedema (37 – lower limb, 8 – upper limb). Mean duration of lymphoedema was 20 years (lower) and 13 years (upper). Pre-treatment mean excess volume was 4179ml (lower) and 1176mls (upper). At 12 months post-operatively the mean excess volume reduction was 94% (lower) and 110% (upper). There was significant variation in LyQLi scores across the time points for all domains for lower limb ($p<0.0001$) but statistical significance was only met in the physical domain ($p=0.005$) for upper limb. There was a significant reduction (i.e. improvement) in LyQLi scores between pre-op and any post-op time point for lower limb ($p<0.001$).

Conclusions: Liposuction with CCT for both upper and lower limb lymphoedema is effective at reducing and maintaining limb volumes with associated improvements in quality of life. A larger cohort of upper limb patients is needed to confirm suspected improvements in the remaining domains.

[48] EARLY INTERVENTION WITH COMPRESSION PREVENTS SHORT-TERM PROGRESSION IN MILD BREAST CANCER RELATED ARM LYMPHEDEMA - A RANDOMIZED CONTROLLED TRIAL

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Introduction: Breast cancer related arm lymphedema (BCRL) may progress without treatment and become a chronic condition. It has been shown that early diagnosis and compression treatment are important to prevent progression. However, in mild BCRL regression can be expected in some patients, and there is a lack of knowledge how many who can manage without compression, without progression of BCRL. Thus, the aim of this study was to examine the proportional difference in regression /progression of arm lymphedema, and difference in arm volume and local tissue water, among women with mild BCRL, treated with or without compression for six months.

Aim:

Method: Women diagnosed with mild BCRL (Lymphedema relative volume, LRV≤8%) were randomized to compression treatment (Compression group -CG) vs no compression treatment (Non compression group -NCG). Both groups received self-care instructions, and CG was supplied by a standard compression sleeve (ccl 1). Primary outcome was the proportional difference in regression/ progression of arm lymphedema during 6 months. Secondary outcomes were differences in arm volume measured by Water Displacement Method (WDM), and local tissue water by Tissue Dielectric Constant (TDC), at baseline, and after 1,2,3 and 6 months.

Results: The proportion of women who had progression of lymphedema was significantly larger in the NCG compared to the CG at 1,2 and 6 months ($p=0.005, 0.013$ and 0.001). However, 43% in the NCG remained stable, or showed a spontaneous regression in LRV. Also, CG had a significant larger reduction in LRV, at all time-points ($p=0.005$ to <0.001), and in the highest TDC ratio, when the same site was followed, ($p=0.025$), at 6 months, compared to NCG.

Conclusions: Early treatment with compression can prevent short-term progression in mild BCRL, but without compression 43% will still not progress.

[49] AMERICAN LYMPHEDEMA FRAMEWORK PROJECT (ALFP) REPORT ON U.S. HEALTH PROFESSIONAL PERSPECTIVES: A PARTNERSHIP WITH THE INTERNATIONAL LYMPHOEDEMA FRAMEWORK (ILF) CHRONIC OEDEMA/LYMPHOEDEMA OUTCOME MEASURES (COM) PROJECT

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Introduction: Research has shown that lymphedema can negatively impact all aspects of an affected person's life, necessitating adaptations in cultural, family, leisure, and occupational roles. On-going issues in building evidence-based treatment consensus guidelines create therapy challenges.

Aim: To explore United States (U.S) healthcare professional characteristics, perceptions of lymphoedema outcome priorities, and outcome measurements.

Method: The online survey was developed and launched by the International Lymphoedema Framework (ILF) using Survey Monkey in 2018-2019 to address lack of consistency and clarity in chronic oedema outcome measures (COM). Fourteen national frameworks collaborated in the survey dissemination. ILF and national frameworks analyzed data addressing stakeholder characteristics and perspectives from health professionals, patients, educators, and industry.

Results: For this report, data from 341 U.S. health care professionals were included in the analysis. Respondents were primarily occupational (42%) and physical (39%) therapists. Two-thirds (67%) of respondents worked in a public setting, followed by a private health care setting (31%). The most frequently-reported work setting was a hospital (46%). Sixty-five percent of respondents reported measuring treatment outcomes, while eight percent reported they did not report outcomes. An additional 12 percent reported they did not know if treatment outcomes were measured. Some 157 (46%) of respondents reported that they did not know if international, national, or regional guidelines existed and 63 (18%) reported there were no such guidelines. The most frequently-used treatment outcomes measures were arm circumference (84%) and mobility (65%). Stable limb volume (54%), improved quality of life (54%), and self-management ability (37%) were the top three measures used by professionals to measure successful lymphoedema therapy.

Conclusions: A substantial number of U.S. health professionals treating chronic oedema and lymphoedema are uncertain of or not using validated outcome measures for successful treatment, nor aware of regional, national, or international guidelines. The ALFP recommends working to increase awareness of national and international standards for lymphoedema care/outcomes through an action plan approach. This plan includes increasing professional education and increasing stakeholder awareness of lymphoedema issues with the goal of increasing care reimbursement.

[50] LYMPHEDEMA MANAGEMENT: A DEFINITION OF THE “PERFECT” TREATMENT

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Introduction: CDT is the world-wide recognized method to conservatively manage lymphedema. Of course, the interpretation of CDT depends on the Country, the relative Cultural Aspects, the demands of the patient and the decision of the therapist.

But what is finally the perfect choice of management protocol? How many treatments do we have to apply? How we can achieve the optimum result? What is the optimum result for the lymphedema and what is the optimum result for the patient?

Aim: Bringing science to aid life, we need a philosophical approach to the “perfect” treatment. Based on experience with lymphedema patients we will try to sensitize the therapists on a more patient-centered management. How we can achieve real quality of life!

Method: Is based on personal experience with lymphedema patients and on mentoring physiotherapists how to manage lymphedema.

Results: Therapists tend to treat the patients according to protocols, giving emphasis to the edema and they strongly ignore the aspect “Quality of Life” for the patient.

15-20 consecutive treatments during phase I of CDT, constant use of self-bandaging, non-stop use of compression garments during phase II are some of the characteristics that are questioned, concerning the quality of life of a “life-long” management.

Conclusions: We need to re-evaluate management protocols and adapt them to patient needs for improvement of life quality.

[51] V Y ADVANCEMENT FLAPS IN PRESSURE SORES

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Introduction: The management of ischial bedsore in paraplegic patients is a challenging affair due to poor mobilisation, high rate of wound infections due to proximity to anal area, repeated suture line break down as ischium is most weight bearing area both in sitting as well as in lying down position. Tensor fascia lata (TFL) flap is considered as gold standard for ischial sores. However, in patients with bilateral ischial or sacral sores, offloading in post-operative period becomes a problem, as both lateral postures have suture lines that are tend to breakdown with continuous pressure and sheering. Patient can be left prone but problems like post feeding regurgitation and development of new pressure point sores is a continued problem. Another way out would be to go for a staged approach, one side a time. However, this leads to repeated procedures and increased duration of hospitalisation.

Aim: To evaluate the role of flaps in reconstruction of pressure sores

Method: This study was done in department of burn and plastic surgery for 2 years in AIIMS Rishikesh in patients with pressure sores. Demographic profile, clinical presentation and management outcomes were recorded. Various flaps were done to evaluate the role of selected flaps in different sites of pressure sores.

Results: Good results were achieved in these patients with local flaps. We are presenting a case series of 6 cases with bilateral ischial pressure sores that were covered with V- Y advancement flaps and yielded excellent results. In our case series, we have highlighted the merits of this flap design over conventional TFL flap coverage

Conclusions: Tensor Fascia Lata flaps are a gold standard in treatment of ischial pressure sores due to robustness, proximity, easy design and good padding.

[52] THE COMPARATIVE EVALUATION OF DEPRESSION, LIFE SATISFACTION AND QUALITY OF LIFE BETWEEN PATIENTS WITH LIPEDEMA AND LYMPHOEDEMA

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Introduction: Lymphedema and lipedema are chronic conditions that have great impact on psychosocial status and quality-of-life (QOL). Comparative studies indicating the depression, life satisfaction in addition to functional status and QoL are lacking in the literature

Aim: The aim of this study was to comparatively evaluate the functional status, depression, life-satisfaction and QoL in female patients with lymphedema and lipedema.

Method: During 12 months; 73 female patients with a diagnosis of pure lymphedema or lipedema were recruited according to inclusion/exclusion criteria. Demographic variables comprising age, BMI, disease duration, stage of disease and exercise/smoking conditions were recorded. Lower-extremity functional scale (LEFS), life satisfaction index (LSI), patient health questionnaire (PHQ-9) and QoL questionnaire (LYMQOL-Leg) were used to assess functional status, life satisfaction, depression and QoL, respectively in both groups. The relationship between questionnaire-scores and demographic variables were evaluated.

Results: 36 females with lymphedema (mean age: 55.1 years) and 37 patients with lipedema (mean age:50.7 years) were included to the study. Demographical variables were statistically similar between the groups ($p>0.05$). Duration of disease was longer (mean: 159.3 months vs 39.6 months) in lipedema group than in lymphedema patients. PHQ9 (mean:11.4 vs 10.4) and overall QoL scores (mean: 5.06 vs 5.47) were similar between groups while LEFS (mean: 44 vs 62) and LSI scores (mean:11.5 vs 14.3) were worse in patients with lymphedema than in lipedema group. There were correlations between age and LEFS ($p:0.014$, $r:-0.40$) and LSI ($p:0.013$, $r:-0.41$) in lymphedema group; and between BMI and LEFS ($p:0.013$, $r:-0.041$) and QoL ($p:0.034$, $r:0.37$) scores; and duration of disease and PHQ9 scores ($p:0.028$, $r:-0.41$) in the lipedema group.

Conclusions: Patients with lipedema have similar depression and impaired QoL as lymphedema patients. But lymphedema patients experience more functional disability and less life-satisfaction. As the BMI and duration of illness are correlated with depression and QoL; early diagnosis and early management are important in order to improve disability and QoL in patients suffering from lipedema.

[53] THE EXPERIENCE OF MEN DIAGNOSED WITH CHRONIC OEDEMA AND LYMPHOEDEMA: A SYSTEMATIC QUALITATIVE META-AGGREGATION APPROACH

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Introduction: The aim of systematic meta-aggregation approach is to address an imbalance in the current evidence base, which is present within the subject area of men diagnosed with lymphoedema. A subsequent scoping exercise undertaken prior, led to one literature review being retrieved that mainly focused upon men (Cosgiff, 2012). This is despite men accounting for up to twenty-per-cent of lymphoedema caseloads, and up to fifty-per-cent of the UK's population (Cooper and Bagnall, 2016).

Aim: How do men diagnosed with chronic oedema/lymphoedema experience the condition within the existing literature?

How is gender considered within the existing literature, specifically men diagnosed with chronic oedema/lymphoedema?

Method: A systematic meta-aggregation method offered by the Joanna Briggs Institute (JBI) was used as a framework to retrieve primary qualitative research. From inception the search strategy did not include a start date but extended to March 2021. A comprehensive search strategy was applied to twelve databases, gray sources, such as Open Gray EU, and hand searching that led to 22 studies being retrieved and appraised (JBI appraisal tool).

Results: Four synthesised findings were identified: 1) The 'New Norm', how diagnosis led them being faced with a 'new version' of themselves. 2) 'Journey into the Unknown' relates to the unforeseen diagnosis of the condition. 3) 'Access' – challenges in receiving a diagnosis, and support. 4) 'Personhood' - the impact of the condition upon external constructs and relationships. These findings were compared to other literature that has focused upon other long-term conditions, and men specifically, with similar findings. Masculinity and its expression can play a key part in men engaging with support mechanisms and strategies in managing their long-term condition. However, there is an absence of gender theory application within lymphoedema, and how this applies to the experiences of men with cancer and non-cancer related causes.

Conclusions: The four findings draw together varying studies, and discusses these against existing literature, but only offers a partial explanation of the complex relationship between men and lymphoedema. However, the evidence base is limited, with the need for further empirical research, and for this to be applied to gender theory (masculinity), and a focus upon men with non-cancer related lymphoedema.

[54] RANDOMIZED STUDY TO COMPARE EFFICACY OF TWO LAYER COMPRESSION BANDAGE SYSTEMS FROM KOB WITH MULTI LAYER LOCALLY USED COTTON CREPE BANDAGES IN THE TREATMENT OF VENOUS ULCERS

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Introduction: Leg ulcers are largely ignored due to lack of awareness and a standard treatment protocol for these patients. This study is being conducted to evaluate the effectiveness of compression bandaging in the treatment of venous ulcers. Lack of compliance due to the difficulty in multilayer bandaging can be improved with the use of a 2-layer system. With this study, we intend to evaluate responses to different types of compression bandaging systems and arrive at a consistent treatment protocol to treat these patients.

Aim: To assess and compare ulcer healing and reduction in swelling after 3 months of treatment with compression bandages of three different types. To assess and compare the following parameters between the three arms of the study.

Method: Primary Objective: To compare efficacy of two types of 2-layer compression bandage systems from KOB and multi-layer locally used cotton-crepe bandages in the treatment of leg ulcers. Patients aged >18yr, with venous ulcer excluding arterial disease, acute DVT, pelvic and groin malignancies or lymphatic obstruction were enrolled. Three study groups: Group 1: 4-layer cotton crepe bandage, Group 2: 2-layer KOB short stretch bandage (752) and Group 3: Elastic padding with KOB elastic crepe bandage (394).

Results: Of 38 patients, group 1, group 2, group 3 had 12, 11 and 14 patients respectively. Median decrease of 5.57cm², 7.1cm² and 22.69 cm² with mean healing rates of 0.18 cm², 0.14cm² and 0.27 cm² /day in group 1, 2 and 3 respectively. While all the three groups showed significant decrease in ulcer size at 3 months (p values 0.002, 0.004, 0.001), their rate of healing did not differ significantly (p=0.32). Mean decrease in limb girth was 1 cm, 1.5 and 2 cm at ankle and 1.75 cm, 0.5 and 1.25 cm at calf in group 1, 2 and 3 respectively. All groups showed significant improvement in the QOL with most improvement in the mean quality of life in Group 3 (increase by 45.25 points) compared to group 1 and group 2 (38 and 24.81 points respectively). Slippage of bandage was significantly less in group 3 (p=0.006). Sub-bandage pressures measured by Pico press device were significantly higher in group 3 both in resting and standing posture.

Conclusions: All bandaging groups had similar rate of ulcer healing. Better sub-bandage pressure, greater decrease in limb girth and lesser slippage of cotton padding with KOB elastic crepe bandage translated in a better quality of life.



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POSTER ABSTRACTS



[P1] SEXUALITY, BODY IMAGE AND RELATIONSHIP ISSUES IN CANCER-RELATED LYMPHEDEMA: IMPLICATIONS FOR HEALTH PROFESSIONALS

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Introduction: Even as society tries to become more open and inclusive, sexuality remains a taboo subject. When cancer is diagnosed, there is an urgency to treat it as soon as possible, aiming for cure, leaving treatment sequelae to be addressed afterwards, if ever. The scientific literature reports that many cancers such as breast, gynecological and prostate frequently lead to sexual or body image concerns. These matters are often made worse if the person has cancer-related lymphedema.

Aim: The aim of this session is to inform health care professionals on the impact of certain common cancer and lymphedema on sexuality, body image and intimate relationship.

Secondly, participants will be led to reflect on how their method of providing lymphedema therapy might impact these issues, positively or negatively.

Method: A scoping review was conducted on the following databases MEDLINE, Cochrane, CINAHL, and Google scholar, available literature until June 2021. Keywords used: Cancer, lymphedema, sexuality, body image. The search was limited to English and French literature, without restriction on the type of studies (e.g., randomized control trials, retrospective studies, systematic reviews).

Results: A total of 213 articles were found, of which 17 were of interest. Findings include that involving both members of a couple to educational sessions on lymphedema management might improve adherence and also help minimize further insult to existing body image or sexuality issues. Referral to specially trained psychologists or sexologists within cancer programs might be warranted, specifically if intimacy was already a challenge before the cancer treatments and/or lymphedema.

Conclusions: Posing a few simple questions to the patient and their partner on sexuality may open up Pandora's box. However, it could also move the patient a step further towards better well-being and quality of life. This session will provide health care professionals with an opportunity to reflect on how to adapt therapeutic process to help patients and couples who may be dealing with sexuality or body image issues related to cancer treatment that is also complicated by lymphedema.

[P3] A 15-YEAR EXPERIENCE IN LIPOSUCTION FOR ARM LYMPHEDEMA IN BREAST CANCER PATIENTS

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Introduction: Breast cancer related lymphoedema (BCRL) is relatively common following lymph node clearance and radiotherapy¹. Affected patients experience both functional and psychosocial problems related to the aesthetically unappealing appearance of gross limb asymmetry. Liposuction combined with postoperative controlled compression therapy, is the treatment for chronic lymphedema with complete reduction of excess volume².

Aim: This paper reports our 15-year experience in treating BCRL with liposuction and compression therapy.

Method: Patients operated between 2005 and 2018 were identified from our lymphedema registry, comprising breast cancer patients with chronic lymphedema resistant to complex decongestive therapy (CDT).

Results: The mean duration of lymphedema was 9.34 ± 1.22 , the mean excess arm volume before surgery was 1267 ± 99 mls and the ratio of lymphedematous arm to unaffected arm was 1.5. At three years, the mean percentage volume reduction was $110 \pm 7.2\%$ with a -5.8% limb difference; at 5 years was $112 \pm 9.4\%$ with a -8.2% limb difference, and this reduction steadily improved up to 10 years of follow up with $122 \pm 11.7\%$ mean volume reduction compared to the original excess volume with a -17% limb difference.

Conclusions: Our 15-year experience in liposuction combined with controlled compression therapy (CCT) has demonstrated significant and stable complete reduction of BCRL for a long term period.

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[P4] THE IMPORTANCE OF PHYSICAL THERAPISTS AS A PRIMARY CARE PROVIDER DURING OEDEMA TREATMENT: REAL LIFE PRACTICE BASED CASES.

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Introduction: The importance of physical therapy as a primary care provider during oedema treatment: real life practice based cases.

As the world of oedema treatment evolves every day, physiotherapy has an important job to keep up during treating lymphoedema patients. Often the therapist has the longest and closest contact with the patients and becomes the primary care provider and the multidisciplinary coordinator. It becomes their role to oversee the follow-up of any other issues that may influence the oedema, provide care that will improve the quality of life, and keep in touch with the other health care providers. Patients will easier take referrals and advice from someone they develop a trustful relationship with. In this capacity the role of a oedema therapist becomes essential in creating a meaningful quality of life.

Aim: Due to renewed surgeries during the treatment of breast cancer, but also the increased reconstructive surgeries and the complexity of such surgeries, physical therapy has become an integral part of post cancer rehabilitation, focused on reducing pain, increasing movement and providing a healthy quality of life style. This includes not only manual lymph drainage, but also exercise therapy, myofascial therapy, compression and prevention. As lymph surgeries increase, so does the need for a good follow up with a complex physical therapy plan in a multidisciplinary setting. It is important for physical therapists to understand the needs of the patient, and the options out there to help them, as they are often the most consistent therapy post hospitalisation.

Method: While the global recognition for lipoedema is increasing, so is the need for physical therapist to be up to date and develop a treatment plan for this specific pathology. This includes compression, motivating exercise and movement, decreasing pain, increasing mobility, but mainly dietary advice and positive reinforcement. Treating lipoedema in an outpatient setting, requires a strong network of healthcare workers. However, this is the future of treating all oedema patients.

Results: Providing a strong multidisciplinary team and making sure the quality of life of the patient is the central point of the care. If doctors save life, physical therapists make it worth living.

Conclusions: Through a few practice based cases, I will be showing the difference physical therapy can make in the patient's rehabilitation. These cases will include post tumorectomy, post mastectomy, lipoedema cases and post breast reconstruction cases.

[P5] EFFECTIVE TREATMENT WITH LYMPHATOUCH OF OROPHARYNGEAL DYSPHAGIA CAUSED BY LYMPHOEDEMA AFTER TREATMENT OF HEAD AND NECK CANCER - A CLINICAL CASE REPORT

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Introduction: According to the Danish Comprehensive Cancer Center the numbers of patients diagnosed with head and neck cancer are increasing with an incidence of 1.600 new patients every year. Due to the treatment of head and neck cancer with radiation therapy, chemotherapy and/ or surgery many patients develop lymphoedema in the face, mouth, and throat area. Lymphoedema can be a stressful condition for the patients and can cause oropharyngeal dysphagia which can complicate the daily meal activities.

Aim: The aim of this clinical case report is to describe an effective way to treat oropharyngeal dysphagia caused by lymphoedema with the LymphaTouch device and thereby enable the patients' ability to ingest food and beverage orally.

Method: After cancer treatment according to the Danish Cancer Patient Pathways the patients suffering from lymphoedema in the head and neck region and oropharyngeal dysphagia as late effect to the treatment are referred to specialized occupational therapy. The specialized occupational therapy consists of treating the oropharyngeal dysphagia by using the LymphaTouch device before training a specific meal activity.

Results: After twenty minutes of treatment with the LymphaTouch device the patients gain a reduced accumulation of lymph fluid in face, mouth, and throat. Due to the treatment the lymphoedema is significantly reduced in the treated area causing decreased pressure on the esophagus and trachea, which results in a more efficient oral processing of food and beverage, improved chewing- and swallowing function as well as improved respiration. After treatment with the LymphaTouch device the patients are more able to eat and drink unmodified food and beverage, contributing to increased quality of life when performing meal activities.

Conclusions: This clinical case study shows a potential for occupational therapists using the LymphaTouch device in treating oropharyngeal dysphagia in head and neck cancer patients, who develops lymphoedema. The treatment with the Lymphatouch device is an easy and efficient way of treating oropharyngeal dysphagia and can improve the patients' ability to ingest unmodified food and beverage. Existing research in this area is minimal, why this clinical case report is best practice so far. This clinical case report illustrates a need for larger studies and further research in treating oropharyngeal dysphagia in patients suffering from lymphoedema as a late effect to the treatment of head and neck cancer.

[P6] A CASE OF AXILLARY WEB SYNDROME (AWS) SECONDARY TO COMPLEMENTARY TESTING

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Introduction: Axillary web syndrome is characterized by the appearance of cords in the axillary region to the inner side of the arm, usually occurring in the immediate postoperative period after complete axillary lymphadenectomy or selective sentinel node biopsy (BSGC) favored by immobilization or post-surgical complications. They are accompanied by limitation of active mobility of the ipsilateral shoulder. In its etiopathogenesis the lymphatic origin is supported without ruling out concomitant venous involvement.

Aim: The objective is to describe an axillary web syndrome, which occurred after the patient underwent a complementary test in the conflicting left upper limb to prevent new cases.

Method: Patient undergoing breast cancer on 5/24/18: harpoon lumpectomy and left BSGC. Adjuvant chemotherapy and radiotherapy completed in July 2018, without complications.

After performing echocardiography on 1/29/19 with forced position due to poor window quality and transducer pressure on the axillary scar, it begins suddenly with an axillary painful condition with limited mobility of the shoulder.

Results: The scan shows axillary cord, active flexion 120°; abduction at 100°, passive free. It is treated by physiotherapy with manual treatment of the cord and shoulder exercises and stretching completely recovering mobility and remitting the symptoms.

Conclusions: Before a limitation of active shoulder mobility in patients with a history of axillary lymph node surgery, we must rule out axillary web syndrome whose treatment usually has good evolution and in our case with resolution of the condition.

We must respect the recommendations of the integrated care process of breast cancer since pressure on the conflicting arm can cause this syndrome.

[P7] MANUAL LYMPHATIC DRAINAGE WITH SWEAT GLAND DERIVED SIGNET RING CELL CARCINOMA AND FACE LYMPHEDEMA: A CASE REPORT

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Introduction: Signet ring cell carcinomas (SRCCs) originating from sweat glands are a rare type of neoplasms. Their aggressiveness calls for wide excision margins and lymph node dissection. The usefulness of chemotherapy remains questionable, whereas radiotherapy is applied in the case of locally advanced tumors. They typically affect middle-aged men and are often located in the eyelid. Facial lymphedema is often an iatrogenic swelling due to head or neck cancer treatment. It may involve external as well as internal tissues. Complex decongestive therapy (CDT) is a cumulated approach for the management of lymphedemas. It consists of manual lymphatic drainage (MLD), compression, exercises, skin care and patient education.

Aim: The purpose of this case report was to explore, whether CDT is a suitable treatment for iatrogenic face lymphedema and scar following signet ring cell carcinoma treatment.

Method: Case report of a male 51-year-old patient with unilateral left-sided facial lymphedema following multiple surgeries including plastic surgery and Epigard wound dressing. This comprehensive attempt left the patient with a large left-sided cheek- and nose defect area, face and head lymphedema and extensive scar tissue.

The treatment included six MLDs (à 50', first sitting, latter supine), instruction for face muscle exercises, patient education on edema and self-applied massage. MLD comprised the neck, axillary lymph nodes, back of the head, face, scar tissue and inner mouth drainage. The patient declined the application of compression therapy, so this was omitted. The parameters measured were pain (VAS), sleeping quality (Pittsburgh Sleeping Quality Index), edema, tissue and scar pliability (3-point Likert scale).

Results: Pain was reduced from VAS 5.5 to 1.5. Tissue and scar pliability improved from grade "two" to "one", but did not reach normality. Sleeping quality improved, the overall questionnaire's sum decreased from 13 to 10 points (maximum 21 points). The patient stopped taking sleeping pills. The swelling of the outer face tissue was not striking or restricted to regions scarcely measurable with common methods.

Conclusions: This is the first case report to reflect CDT in edema following SRCCs. CDT even without compression is an effective treatment modality for minor external and suspected internal lymphedema and scar following oncologic surgery.

[P8] PROMOTING ADHERENCE IN A BREAST CANCER-RELATED LYMPHOEDEMA PATIENT STILL STRUGGLING TO ACCEPT HER CONDITION

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Introduction: This Case Report is about a 64-year-old woman who developed lymphoedema in her left arm immediately after breast cancer treatment and breast reconstruction in 2015. Lymphoedema advice was sought and her lymphoedema was graded as stage II according to the International Society of Lymphology standards. Decongestive lymphatic therapy (DLT) was implemented, but she struggled to come to terms with what it involved – not least wearing the garments. This particular aspect of care was difficult for the patient to deal with as she felt the sleeves issued were uncomfortable and ill-fitting. Psychologically they are a constant reminder of her cancer diagnosis and there were cosmesis issues too. As a result of all these factors, the patient was only able to tolerate wearing a sleeve for around 6 hours daily (as opposed to the suggested 8-10 hours).

Aim: The aim was to enable the patient to wear a compression garment for longer each day. Other objectives were to increase comfort during wear and achieve improvement in clinical features of her lymphoedema (fibrosis).

Method: The patient was prescribed a made-to-measure flat-knit compression class 2 JOBST® Confidence arm sleeve designed with a unique Contour-Fit Technology. The observation period was 24 days. Parameters assessed included the wearing time, skin/tissue condition and limb volume. The patient was also encouraged to report her own opinions of JOBST® Confidence including the fit, shape, wearing comfort, ability to remain in place, ability to participate in exercise, its breathability, and the ease of donning.

Results: The patient's adherence to the arm sleeve was very good as she wore it for 10 hours every day. At the end of the observation period, her skin condition had improved and the fibrotic tissue was much softer. The lymphoedema had reduced in size with a volume reduction of 265 mL. The rating of the patients' perceptions of JOBST® Confidence was as follows: she was 'very satisfied' with the fit and shape of the garment. She rated its wearing comfort as 'comfortable', its ability to remain in place and to allow to take part in exercises as 'good', its breathability as 'good' and ease of donning as 'very easy'.

Conclusions: The treatment aims were achieved. The reduction in limb volume reduced the patient's fear about the underlying cause of her lymphedema. It also demonstrated that adhering to compression therapy can indeed improve lymphoedema, indicating that innovative product developments can promote adherence.

[P9] INVESTIGATION OF THE EFFECTS OF 1ST PHASE OF COMPLEX DECONGESTIVE TREATMENT, WHICH IS APPLIED TO PATIENTS DEVELOPING LYMPHEDEMA AFTER CANCER SURGERY, ON SLEEP AND QUALITY OF LIFE: A PILOT STUDY

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Introduction: Poor sleep quality is caused by symptoms caused by cancer and a common problem during cancer treatment. Lymphedema, which can develop after cancer surgery, can also negatively affect the sleep quality of people. Complex decongestive therapy (CDT) is considered as the gold standard in the treatment of lymphedema. In scope of our literature research, we could not find any study investigating the effects of CDT on sleep in patients who developed lymphedema after cancer surgery.

Aim: The aim of this study is to investigate the effects of the first phase of complex decongestive therapy applied to patients who develop lymphedema after cancer surgery on pain, sleep and quality of life.

Method: Twelve patients who developed lymphedema after cancer surgery were included in the study. The demographic data of the patients and the surgeries they underwent were recorded. 1st phase of complex decongestive therapy was applied 5 days a week for 3 weeks. Evaluations were made before and after treatment. Pain was assessed with VAS, sleep was assessed with the Pittsburg Sleep Quality Index and quality of life was assessed with the Lymphedema Quality of Life Questionnaire. The volume of the affected extremity was measured with a tape measure at 4 cm intervals from the ulna to the axilla and converted to volume using the frustum formula.

Results: The mean age of the participants was 48.33±13.30, the mean height was 160.91±10.63, the mean weight was 95.16±16.77, and the body mass index was 37.1. 4 patients had mastectomy, 4 patients had lumpectomy, and 4 patients had endometrial cancer. 16.7% (n:2) of the participants had stage 1 lymphedema, 58.3% (n:7) stage 2, 25% (n:3) stage 3 lymphedema. Significant reduction in extremity volume (p=0.014) and pain (p=0.000) was observed after treatment. At the same time, significant improvements were obtained in sleep (p=0.000) quality of life function (p=0.016), emotional state (p=0.010) and general quality of life score (p=0.004).

Conclusions: It has been shown in the literature that complex unloading physiotherapy has positive effects on extremity volume, pain and quality of life. In this study, we concluded that it improves sleep as well as pain, extremity volume, quality of life.

[P10] THE VALUE OF PROSPECTIVE SURVEILLANCE FOR THOSE AT RISK OF CANCER-RELATED LYMPHOEDEMA

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Introduction: Surgery remains the cornerstone in the management of many cancers, often performed with the intention of cure. In spite of significant advances in surgical techniques and approaches, post-operative complications such as lymphoedema can impact significantly on a patient's quality of life. Cancer related lymphoedema, (CRL) is seen most commonly post treatment for breast, colorectal, cervical, melanoma and genitourinary cancers. The true data for CRL in Ireland is unknown, but it is estimated that there may be 1,490 new cases per year (HSE, Model of Care, 2018).

It is accepted widely that the high 'at risk' timeframe for CRL is within the first 24 months, post treatment.

(McLaughlin et al. 2017), highlights that that prospective randomized trials continue to document the incidence of lymphoedema after any axillary treatment, with the risk increasing by 25-40% after combination therapy ie axillary surgery and radiation which, presents a significant burden to global health. Recommendations from that study state that clinicians should establish a surveillance plan for patients because early diagnosis leads to early treatment and a reduction in disease burden. In Ireland, the HSE Model of Care 2018 reiterates this recommendation.

The benefits of prospective surveillance offer an opportunity for subclinical lymphoedema to be detected at an early stage and thus facilitate early intervention. Stout et al., (2012), demonstrated that prospective surveillance which lead to early intervention is more cost-effective than intervening after obvious swelling occurs.

Aim:

1. Examine the Value of prospective surveillance for those at risk of cancer-related lymphoedema. of malignancies in an Irish setting.
2. Highlight the incidence and prevalence of subclinical and subsequent clinical lymphoedema in patients undergoing treatment for a variety
3. Develop evidence-based resources for cancer patients in Ireland to help with improving treatment related outcomes and supporting the cancer survivor.
4. Evaluate the impact of prospective surveillance and early intervention for lymphoedema on quality of life and well-being

Method:

Proposed methods

This will be a mixed-methods prospective study based on quantitative and qualitative research.

Results: This study will commence September 2021, funded by Break Through Cancer BCR Cork

Findings and results will be documented and disseminated both nationally and internationally and through peer-reviewed publications.

Conclusions: Participation in this study may establish a new standard of care for prospective lymphoedema management in cancer care in Ireland, contributing to the outcomes of future generations of patients with cancer.

[P11] THE EFFECTS OF OBESITY ON COMPLEX DECONGESTIVE THERAPY OUTCOMES IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA

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Introduction: Upper extremity lymphedema is a concerning complication after treatment for breast cancer. If left untreated, functional disability, psychosocial problems, and impaired quality of life (QoL) can be seen in patients with breast cancer related-lymphedema (BCRL).

Aim: The aim of this study was to evaluate the effect of obesity on complex decongestive therapy (CDT) outcome in patients with BCRL, in regard to volume reduction, functional status and QoL.

Method: The patients with unilateral BCRL who were provided CDT in the last 12 months were retrospectively recruited to the study. Patients were classified as having normal/overweight (group1) and obese/morbid obese (group2). All patients received combined phase1 CDT including skin-care, manual lymphatic drainage, multilayer bandaging and supervised exercises five times/week for three-weeks, as a total of 15-sessions. The limb excess volumes according serial circumference-measurements of the limb, which were determined at baseline and at the end of third week, were recorded from the files. The improvement of functional disability and QoL scores which were evaluated by Q-DASH and Lymphedema QoL-Questionnaire-Arm (LYMQOL-Arm) questionnaires and recorded to files routinely, were compared between the groups.

Results: A total of 81 female patients (group1:36, group2:45 patients) with a mean age 53.64±10.43 years, were analyzed. The mean age, median duration of lymphedema and number of patients according to stage of lymphedema were similar between groups. There were significant improvements in volumes (Group1:3066±669cm³ vs 2759±537cm³, Group2:3276±683cm³ vs 2979±609cm³ p<0.001), functional scores (Group1: 40.34 vs 34.32, Group2: 44.54 vs 37.34 p<0.05) and all subscores of LYMQOL-Arm questionnaires (overall QoL; Group1:6.5±1.6 vs 7.9±1.2, Group2:5.3±2.1 vs 7.7±1.3 p<0.001), in both groups after the CDT. The improvement in excess volumes and functional status were comparable between the groups while the LYM-QoL-functional and appearance sub-scores were statistically lower in group2 than in group1.

Conclusions: In conclusion, obesity may have a negative impact on CDT outcome in regard to QoL but not to volume reduction and functional improvement. We suggest the health professionals to be aware of this subject and inclusion of education on weight control, in order to increase the QoL, in the management of BCRL.

[P12] PRELIMINARY STUDY OF A TELEMATIC POST SURGICAL TREATMENT FOR BREAST CANCER SURVIVORS DURING SARS-COV2 PANDEMIC.

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Introduction: Early post-surgical treatment in breast cancer survivors according to the prospective surveillance model is effective in preventing and treating breast cancer related lymphedema. During the pandemic, our circuit was affected so a new telematic tool was created for the treatment of these patients.

Aim: The aim of the study is the implementation of an educational tool in our breast cancer survivors for treat the early complains after surgery during SARS-CoV-2 period.

Method: Prospective descriptive pilot study. Inclusion criteria: Adult women who have gone through a surgery for breast cancer in our referral center. Having a remote connection device. No language barrier or sensory limitation. Reading and signing the informed consent. Completing the telematics program between 25/05/2020 to 20/04/21. Variables analysed were: presence of limitation of shoulder ROM, circumetry of both arms, scar adhesion and handgrip. The telematic program consisted in a session of one hour per week during three weeks in a maximum of 4 women groups. It included self-management, mobility, muscle strengthening, manual lymphatic drainage, and self-massage of the scars. Home audiovisual support was also delivered at the beginning of the treatment. Statistical analyses were performed using IBM SPSS Statistics 23.

Results: 49 patients, mean age 50.5 +/- 9.3 SD; 91.8% right-handed; 53,1% were left-side surgery. Tumorectomy was made in 50%, and 63.3% were lymphadenectomized. Pre-programme values were: handgrip 18,13 +/- 4,89SD Kg; 71,4% initial volume of the arm was less than 5% compared with contralateral; 67,3% had scar retraction and 44,9% limitation of arm mobility. In the subsequent control visit they had a handgrip 19,96 +/- 4,026SD kg; 69,4% volume circumetry less than 5% compared to contralateral; 12,2% scar retraction and 30,6% limitation of mobility. Infiltration techniques were required in 38.8% of cases. No complications were found in 71.4%, being shoulder ROM limitation the most frequent in 14.3%.

Conclusions: The new early telematic rehabilitation program has proved to be a safe tool in recent breast cancer surgery patients. Most patients didn't have any complications, but our data shows less presence of lymphedema that needs decongestive treatment than difficulties in shoulder ROM with consequent need of invasive techniques.

[P13] TREATMENT-BASED RISK FACTORS LEADING TO BREAST CANCER-RELATED LYMPHOEDEMA: A META-ANALYSIS

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Introduction: The risk of developing breast cancer-related lymphoedema (BCRL) due to individual breast cancer treatments is widely reported however, patients often receive combinations of treatments rather than just one treatment for breast cancer. The literature lacks a comprehensive analysis to determine the risk of BCRL incidence due to the various combinations of treatments. There is a need to determine which commonly-administered combinations of treatments pose the greatest BCRL risk. This is useful for prioritising the deployment of BCRL prevention technologies that may bring some inherent risk.

Aim: To determine the treatment combinations that pose the greatest risk of developing BCRL.

Method: A systematic review of the literature was conducted following PRISMA guidelines. Four databases, including OVID Medline, were searched using 16 key words and/or mesh terms such as: breast cancer, lymphoedema, sentinel lymph node biopsy (SLNB), chemotherapy, radiotherapy, hormone therapy, axillary lymph node dissection (ALND), lumpectomy, and mastectomy. The resulting 2640 studies were screened to identify a subset of publications that reported rates of lymphoedema with respect to breast cancer treatment type. Lymphoedema incidence was subsequently extracted and stratified by treatment type. Employing a random effects model, these data were used to calculate the incidence rates and log odds ratio (log OR) for BCRL development per treatment type or combination thereof.

Results: A preliminary analysis of 51 studies revealed that treatment combinations including SLNB reduced the incidence of BCRL compared to those without ($p < 0.05$). While SLNB alone was associated with the lowest chance of developing BCRL (log OR = -1.64), increasing the number of different treatment types in combination with SLNB increased the incidence of BCRL. In this respect, the highest log OR was found for the combination of SLNB, RT, and CT (log OR = -0.82). Higher chances of BCRL incidence were linked to both ALND alone (log OR = 0.73) and treatment combinations including ALND (ALND+RT+CT; log OR = 0.82).

Conclusions: This meta-analysis showed that patients who are treated with ALND in combination with other treatments are at greater risk for developing BCRL; those who are treated with SLNB are at lower risk. This study is intended to be used as a guide to identify patient cohorts in clinical trials who would benefit most from new BCRL interventions.

[P14] COMPLEX DECONGESTIVE THERAPY IN CHILDREN WITH LYMPHEDEMA

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Introduction: Primary lymphedema (PL) in children is a challenge both for children and their parents. It can have its onset at any age and requires individualized approach in management and treatment. The common problem of PL in children apart from diagnostics, is treatment options, including self-management, that should be done mostly by parents.

Aim: To find out what is the role of CDT done by parents in lymphedema management for children with PL, and what can the necessary supplements to classic CDT in these cases.

Method: a systematic literature - PubMed, Medline, Cochrane, and ALF, ILF, LE&RN, LSN resources were observed. Moreover, an analysis of our PL patients clinical cases (42), observed for 4 years was performed, to find the connection between severity of lymphedema symptoms and early/late start of CDT and the involvement of parents in the treatment process, and to understand what is the best way to adjust and supplement classic CDT for children of different ages.

Results: If CDT started more than 2 years after lymphedema onset, its results were not as good as when CDT started during the first year. The children, whose parents are performing CDT on regular basis (in addition to CDT in specialized clinic) and who comply to compression garments, show the best long-term results when compared to children who receive CDT in clinic only and wear compression garments. Orthopedic assessment and correction are crucial for muscle pump development and function if a child has orthopedic issues. Psychological support is essential in management of these children, as well it is very important that their parents get it too, because they are forming an environment in which a child is brought up and how he will see and accept himself and his condition.

Conclusions: After noticing PL onset, CDT should start as soon as possible. After 1st CDT phase in clinic, it should be done by parents on regular basis. Children with lymphedema should be observed by orthopedic specialists to choose the best option of orthopedic problems correction, if present. Both children with lymphedema and their parents need psychological support.

[P15] STRATEGIES FOR TREATING CHILDREN WITH LYMPHEDEMA IN AN OUTPATIENT SETTING

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Introduction: Treating children with lymphedema is not always easy, but it can be profoundly rewarding. Mutual trust and friendliness between the child and the therapist, is a prerequisite to successful complete decongestive therapy (CDT), and is just as important as education of the parents. Therapists, who are open for surprises and willing to accept the challenge of working with possibly stressed-out children and their parents, will earn the deep satisfaction that accompanies making such a positive impact on the lives of young patients.

Aim: This presentation addresses numerous considerations such as the age, development and previous experiences the child has had with lymphedema therapy and how it pertains to the current goals of the treatment. Further attention is given to the choice of appropriate bandages and compression garments, as well as the ability of the child to move freely during and after lymphedema therapy.

Method: Over several years, children - some less than one year of age - and their parents were guided in an outpatient setting by a network of physicians, therapists, and medical supply stores. All phases of CDT, including self-management, were applied to children even as young as age three. By carefully cataloging numerous photographs and case studies, it is possible to observe the development of young lymphedema patients, some as they grow in to their teenage years.

Results: Complete decongestion therapy is the gold standard of lymphedema treatment, not only for adults, but for children as well. Treating children with all five phases of CDT – (1) manual lymphatic drainage, (2) skincare, (3) compression bandaging and garments, (4) movement in compression and (5) self-management - is possible, and is necessary to prevent worsening of the clinical condition. If treated regularly and properly at a young age, it even seems possible that some children are able to “outgrow” the lymphedema.

Conclusions: Proper lymphedema management is essential for patients of all ages, even more so for children during their critical developmental years. Therapists who are willing to take the challenge of working under ever changing and often non-ideal conditions are rewarded with the knowledge and experience of having made a positive difference in the lives of their young patients.

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[P16] RE-AUDIT OF CHILDREN WITH LYMPHOEDEMA ATTENDING SERVICES IN THE UK

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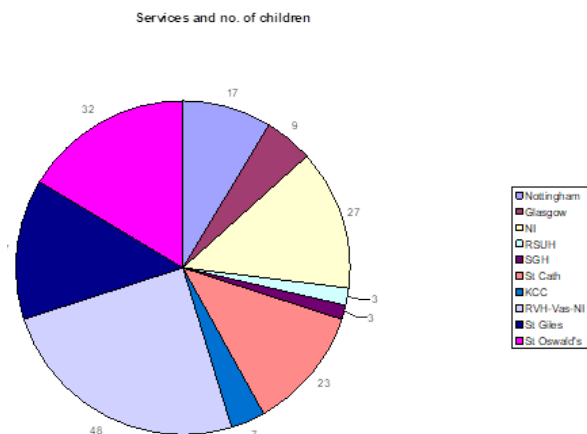
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Introduction: The British Lymphology Society's Children's Specialist Lymphoedema Interest Group (CLSIG) is a group of specialists working with children who have lymphoedema in the UK and was developed in 2009. The aim of the group is to promote and facilitate the interchange of ideas and knowledge between members focusing on the diagnosis, assessment and management of children with lymphoedema, and to plan and deliver a national event for children with lymphoedema and their families every two years.

Aim: One of the initial objectives was to collect data on the children within the UK receiving lymphoedema care to provide some insight into the known incidence, presentation of lymphoedema and difficulties with diagnosis/referral (Todd, Craig, Todd et al, 2014). The audit was repeated to assess any changes in presentation but the proforma was adjusted to reflect the questions in the Limprint data collection form (Moffatt et al, 2019) and allow some comparison of data collected on adults.

Method: Each practitioner in the group completed the proforma for each of the children on their case lists and collected on an excel spread sheet. This was collated by one member of the team and analysed. Simple statistical analysis has been done to date but further comparative analysis is currently being undertaken.

Results:



Total number = 199

Male = 89

Female = 110

A small number of the children suffer from Ingrown toenails (8), Ski slope nails (7), warts (4)

Treatment = 8

Cellulitis = 26

Swelling in arms = 42

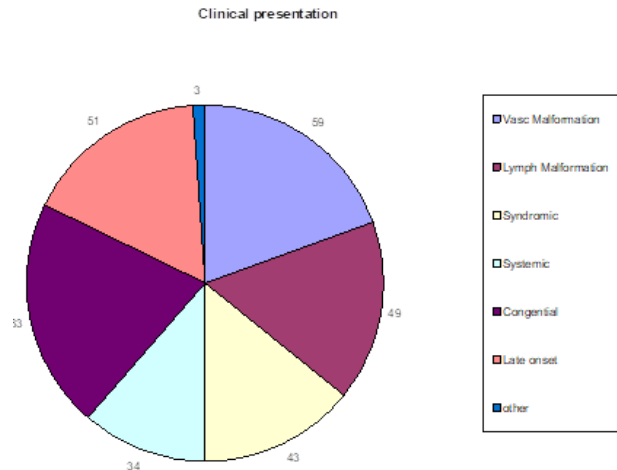
Legs = 128

Both = 13

Trunk = 15

Genital = 14

Congenital presentation = 63 (23 Milroy)



Conclusions: As little is known about the actual numbers of children living with lymphoedema in the UK and as those known to Lymphoedema services in the UK is likely to only be the tip of the iceberg rather than all cases, any information pertaining to the cause of lymphoedema and lived experience is essential when planning future paediatric lymphoedema service development.

[P17] IMPACT OF LOCKDOWN ON PRIMARY PEDIATRIC LYMPHOEDEMA IN ITALY: FOCUS ON THE EFFICACY OF EDUCATIONAL LYMPHOEDEMA CHILDREN'S CAMPS IN DAILY SELF-MANAGEMENT.

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Introduction: During Spring 2020 strong restrictions on mobility were imposed in Italy due to Covid-19 pandemic. Access to physical treatments for several chronic diseases, such as lymphoedema, was either discontinued or restricted to acute cases. However, in order to limit the worsening of lymphoedema, iterative physical therapies were required together with techniques of self-management for patients and their relatives.

Lymphedema children's camps were aimed at promoting joining of families and reducing psychosocial impact of disease. Camps also favored involvement in self-care of an increasing number of families.

Aim: The aim of this study was to explore the parental experiences of caring children and adolescents with lymphoedema during 2020 lockdown in Italy and to measure the efficacy of education therapy (acquired during children's camps) at the time of pandemic.

Method: Thirty-nine families of kids and adolescents anonymously participated in an online survey. The mean patient age was 9 years (range 1-19). Twenty-two families (57%) were previously involved in our educational camps (and represented the study group).

Data were analyzed using SPSS Statistics.

Results: The evidence of a greater effectiveness of the self-care techniques during the lockdown have been proved by the observation that lymphoedema was found to be clinically stable or even improved in the study group compared to controls (Spearman Rho coefficient 0.61; $p=0.02$). Self-care learning was also associated with a wider variety of employed techniques. A higher propensity in the application of lymphatic drainage vs compression was noted in the study group (Rho 0.53 $p.< 0.01$). Self caring attitude was also found to be associated with both quality of attendance to educational camps (Rho 0.63, $p.=0.02$) and number of attendances (Rho 0.57, $p.<0.01$).

Conclusions: Lymphoedema children's camps had a significant impact on systematic application of self-care techniques for lymphoedema management at the time of pandemic.

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[P18] THE EFFICACY OF REHABILITATIVE AND SURGICAL APPROACHES IN A MORBID OBESE PATIENT WITH LYMPHEDEMA

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Introduction: The management of advanced lymphedema is difficult especially in obese patients.

Aim: Herein we report a morbid obese patient with advanced lymphedema who was successively treated with combined rehabilitation program and surgery.

Method: A 46-year-old female patient (BMI:42) was admitted to our hospital with complaints of swelling in both lower extremities, difficulty in performing activities-of-daily-living (ADL) and inability to walk. Her complaints have been present for many years, but increased significantly in the last 6-years and she has become bedridden. She had hypothyroidism and hypertension. The patient had advanced lymphedema with characteristic fibrotic skin changes, skin folds and lobular lymphatic accumulations in both lower extremities, more prominent on the left side. There was lymphorrhea and hyperemia in left leg and stemmer-sign was positive in both sides. The patient was diagnosed with stage 4 lymphedema due to obesity and hospitalized for lymphedema-rehabilitation. Medical treatments were arranged for hypothyroidism/hypertension. Replacement therapy was provided for deficiency of vitamin-D and B12. Medication for fungal-infection at both-feet was also started. A special slimming-diet was started. Complete decongestive therapy (CDT) consisting of skin-care, manual lymphatic drainage, multilayer bandaging and therapeutic-exercises were applied for 9 weeks. Laser treatment was added to the fibrotic parts of left leg.

Results: The volume of both legs was decreased by 60%, skin changes were improved and she lost 27 kg at the end of 9 weeks. She began to walk independently and could perform all ADL. On discharge from the hospital; she was diagnosed with COVID-19 and hospitalized in infectious-disease ward. After 2 weeks she was re-accepted to Physical Medicine and Rehabilitation service as the edema at both legs was increased during hospitalization for COVID-19 infection. CDT was re-started. At the end of 6 weeks-CDT, the edema was decreased by 80% in both sides compared to baseline. Functional status and quality of life were also improved in addition to reduction in depressive mood. Due to the weight-loss, the sagging skin in the abdomen and left leg was excised by plastic surgeons. The results of surgical treatment are awaited and the patient is still under follow-up.

Conclusions: Our case report indicates that even a morbid obese patient with elephantiasis and comorbidities can be successively managed and become completely independent with intensive rehabilitation program followed by surgical methods. In conclusion, we would like to emphasize the long-term combined therapies including conservative and surgical approaches in morbid obese patients with advanced lymphedema.

[P19] EFFECTIVENESS OF AN AYURVEDIC TREATMENT PROTOCOL FOR CHRONIC NON-HEALING WOUNDS - A CASE SERIES

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Introduction: Chronic non-healing wounds are considered to be biggest challenge among healthcare providers. A chronic wound inflicts patients with hospitalization and impacts their quality of life. Venous ulcers are the most common type of non-healing leg ulcers (around 85%). Ayurveda, an ancient Indian medical science has comprehensively explained about wounds and its healing techniques. Susrutha, who is considered as father of surgery has explicitly described about the etiopathogenesis and management of wounds in his text named 'Susrutha Samhita' (600BC). Comprehensive management of wounds has been given in the form of sixty procedures in this ancient Ayurvedic surgical text. Procedures for the early management of inflammation, surgical procedures for wound management, various treatments for cleaning and healing of wounds, treatments to encourage granulation, methods for normal restoration of skin and other cosmetic aspects of the scar are dealt in these sixty procedures. Further, condition-based tailoring of treatment protocol is advocated by the text from these sixty procedures.

Aim: The case series aims to describe the effectiveness of an Ayurvedic treatment protocol for the management of chronic non healing venous ulcers.

Method: Five patients (four men, one woman, age - 36 to 62 years) with non-healing (history of 1.5 to 10 years) venous ulcers with minimal to extensive clinically observed oedema were treated in a tertiary research hospital with Ayurvedic treatment protocol: Kashaya Dhara (wound irrigation with decoctions), bandha (bandaging with medicaments), Snehapana (internal oleation), Virechana (purgation), Manjistadi Kshara Vasti (medicated enema) & Jalaukavacharana (Leech application) and these patients were followed up to 3 months to check recurrences.

Results: By 4-6 weeks of treatment, wound healing was achieved with mean healing time of 38.4 days with considerable reduction in limb girth. Further there were no adverse events reported during the treatment period. During the follow up period of 3 months, there was no recurrence of wound in four patients.

Conclusions: This case series demonstrates that comprehensive Ayurvedic treatment protocol of wound management is safer and effective in the treatment of chronic non-healing ulcers. The effectiveness observed during the treatment phase sustained across the follow up period of 3 months as well. Further studies with larger sample and longer follow up periods are needed to build stronger evidence, but these preliminary findings are promising for wound care through complementary and alternative medicine.

[P20] MODELLING AND DESIGN OF A NOVEL HIGH RESOLUTION PNEUMATIC COMPRESSION THERAPY LEG GARMENT

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Introduction: Lymphedema is an increasingly common chronic condition resulting in potentially severe swelling, permanent tissue modification, fibrosis and cellulitis. Lymphedema is incurable and requires continual vigilance and care to manage (1).

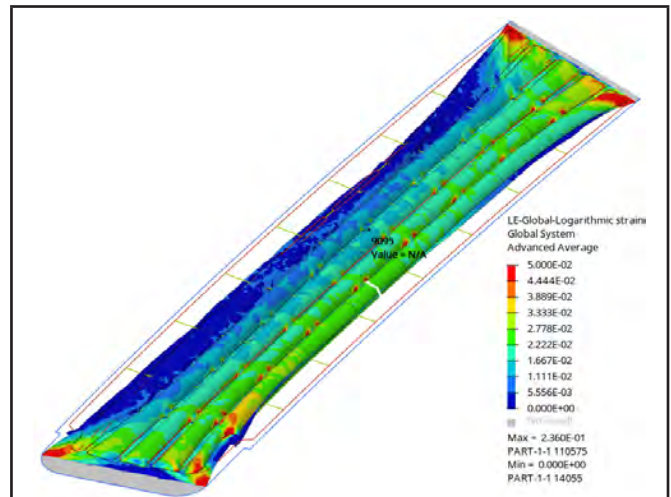
Manual lymphatic drainage (MLD) is an effective therapy: gentle pressure and shear are applied to the skin encouraging lymphatic flow (2). Pneumatic compression therapy (PCT) is an effective therapy (3; 4) and devices are available with different garment designs, modes of operation and pressure ranges (5). Excessively high pressure is associated with discomfort and other detrimental effects. (6). Research has shown efficacy sensitivity to varying both spatial and time gradients of pressure application (5).

PCT garments typically consist of a number of pneumatic chambers along the limb. The Aria Free™ PCT device (Aria Health, USA) has a unique design with multiple channels per chamber designed to imitate MLD by providing more gradients of pressure within the limb contact area.

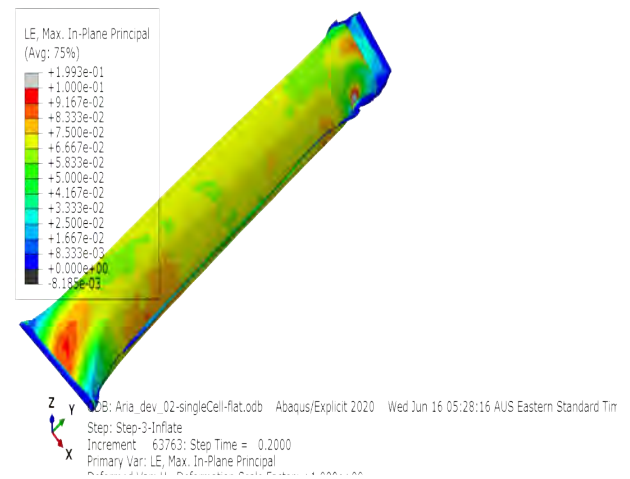
Aim: This study compares the interface loads of the Aria garment to a traditional garment using Finite Element Analysis (FEA) (7).

Method: Abaqus FEA (Dassault Systèmes) was used to model both Aria and traditional chambers on a section of leg. Explicit transient analysis was used to model a pneumatic inflation cycle (30mmHg). The textile material was modelled using membrane elements and the pneumatic volumes using an enclosed fluid cavity, commonly used for airbag analysis. The Aria air channels were partitioned into 35 analysis cavities. An ideal gas model was used to relate pressure, temperature and volume in each cavity; adjacent cavities interacted using a dynamic orifice model. Leg geometry was reconstructed from open source CT data meshed using 2nd order elements. Penalty-based methods modelled interactions between leg and garment.

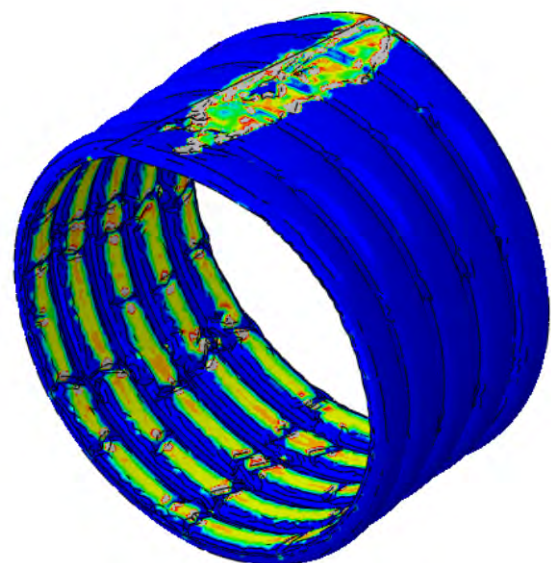
Results: Simulation results showed spatial resolution of pressure along the leg length is refined to approximately 20mm compared to 100mm for the single cell at 30mmHg. These models highlight the differences between the spatial resolution of the sequential compression and the progressive pressure applied using both the Aria Free™ air channel design and traditional single-volume chambers.



Multi-channel design with finely graded pressure application



Single chamber design bulging. Coarse pressure application region



Contact pressure profile when wrapped showing fine spatial resolution of applied pressure.

Conclusions: Simulation results are a powerful tool providing insight and understanding to complex processes. Additionally, recent techniques such as lymphatic imaging have highlighted the individual nature of lymphedema, providing opportunity for personalised therapies (8).

The multi-channel garment design guided by simulation of therapy mechanics provide a powerful set of tools to understand, refine and potentially personalise therapy for each individual's anatomy and pathology.

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[P21] IMPROVING SYMPTOMS OF ATYPICAL KLIPPEL-TRENAUNAY SYNDROME BY USING AN INNOVATIVE FLAT-KNIT COMPRESSION GARMENT

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Introduction: This Case Report describes a 36-year-old woman who was born with congenital primary lymphoedema (atypical Klippel-Trenaunay syndrome including vascular anomalies) in her lower right leg. Her lymphoedema was graded as stage II according to the International Society of Lymphology standards. She experienced frequent recurrent episodes of cellulitis, lymphorrhea and thrombosis. To reduce the lymphorrhea in the digits, she wore a toe glove, interspersed with toe bandaging, under a compression garment. She was prescribed blood thinners to prevent thrombosis and prophylactic antibiotics to reduce the risk of cellulitis. The patient also had prominent blood vessels and blisters, which could become irritated and sore. Having started compression therapy 9 years ago, her biggest problem was the ankle flexure, which tended to become sore and uncomfortable due to rubbing of the garment.

Aim: The treatment aim was to ascertain if the shape and size of the leg could be maintained or improved and the discomfort at the ankle flexure and the vascular anomalies reduced.

Method: The patient was prescribed a made-to-measure flat-knit compression class 3 JOBST® Confidence knee-high stocking designed with a unique Contour-Fit Technology. The observation period was 26 days. Parameters assessed included wearing time, skin and tissue condition, and limb volume. Several self-reported perceptions of JOBST® Confidence were assessed including fit and shape, comfort, ability to remain in place, ease of exercise with garment in situ, breathability, and ease of donning.

Results: The patient's adherence to compression therapy was very good (wearing time 14 hours/day). At the end of the observation period, the vascular anomalies and blood blisters had visibly improved, and the leakage from the toes had reduced significantly. The tissues had softened. Discomfort and soreness at the ankle flexure had reduced due to less friction. The volume of the right leg had reduced by 541 mL. The patient was 'very satisfied' with the fit and shape of the garment and rated its wearing comfort as 'very comfortable'. The ability to remain in place, to participate in exercise and the breathability was rated as 'very good'. She also found the stocking 'very easy' to don.

Conclusions: The treatment aim was met beyond expectation: shape and size of the leg improved while discomfort at the ankle flexure and vascular anomalies reduced, resulting in improved cosmesis and reduced risk of infection. Altogether, these results, achieved over a short period of time, show the potential of this innovative garment in compression therapy.

[P22] CREATIVE BANDAGING OF UNUSAL FORMS

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Introduction: A well-fitting compression bandage is essential for the treatment of patients with lymphedema. Properly applying a bandage to an unusual body form can be quite a challenge. By using knowledge of bandaging materials in combination with the laws of physics, as well as a cultivated and adventurous sense of creativity, lymphedema therapists are capable of bandaging almost anyone and anything.

Aim: This presentation provides an overview of a unique way of looking at bandaging and aims to inspire therapists to “think outside the box” when responding to lymphedema patients’ goals and needs. It offers specific guidance on effective strategies for treating the development of fibrotic proliferation, as well as preventing it whenever possible.

Method: Through application of the Law of Laplace, therapists choose the most appropriate materials to customize compression elements and incorporate them into the bandaging process. Using increased pressure and uneven bandaging surfaces can break up patches of fibrotic proliferation and allow skin to return to a more elastic state. Bone protrusions and tendons, however, require reduced pressure in order to prevent injury to those anatomical structures and allow patients to wear their bandages with increased comfort. Understanding Starling’s Equilibrium, on the other hand, allows therapists to apply gentle compression in order to enlarge the resorption area of post-traumatic edema. This use of compression bandaging prevents development of fibrotic proliferation when massive hematoma is present.

Results: The best compression bandage is comfortable for patients to wear and does not loosen or slip or present danger of tripping or stumbling. Since they view each bandaging process as an opportunity for improvement, therapists form a team with patients and incorporate their feedback into each subsequent bandaging session. This ensures optimal adherence to the treatment plan which is fundamental when working with patients with lymphedema.

Conclusions: Creative and adventuresome lymphedema therapists combine knowledge of the laws of physics with expertise in choosing appropriate bandaging materials, thus assuring the best possible outcome for patients undergoing manual lymphatic drainage and complete decongestive therapy. Taking time to practice the art of bandaging unusual forms builds skills and confidence and allows therapists to bandage (almost) anything and anyone. It is a challenge that is fun!

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[P23] NEAR-IR LYMPHATIC TRANSPORT IMAGING TO EVALUATE RESPONSE TO AN AMBULATORY SMART WEARABLE DEVICE

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Introduction: Lymphoedema is a chronic condition with unmet need where patients continue to struggle with treatment options. In this study, Dayspring™, a next-generation ambulatory connected wearable device is evaluated using ICG lymphatic imaging.

Aims: To evaluate the safety and efficacy of Dayspring™, an ambulatory connected wearable device that applies calibrated sequential gradient compression. This clinical study was designed to evaluate the device’s ability of lymphatic transport, in healthy and subjects with lymphoedema.

Method: The study was designed as a controlled prospective open-label non-randomised study. 7 subjects were enrolled and evaluated pre and post use of device. 0.02mg of Indocyanine green (ICG) was administered intradermally. Lymphatic pathways and transport of lymph was recorded using a Near-Infrared (NIR) camera.

Results: The Dayspring™ device was administered to all subjects and lymphatic transport observed pre and post use of device. The device was self-administered and allowed all subjects to be mobile during active treatment. Additionally, the device was Bluetooth-enabled allowing connectivity and remote patient monitoring. Results from imaging demonstrated potential for aiding lymphatic function for all subjects, defined as proximal movement of dye after therapy.

Conclusions: Advances in compression technology have potential to improve the treatment of lymphoedema. The Dayspring™ device provides benefits in complete ambulatory use and connectivity for adherence. Results from this preliminary study demonstrated potential improvement of lymphatic function in all subjects. The device was found to be safe with no adverse events.

[P24] THE USE OF SUPERVISED SELF-REDUCTION TREATMENT TO INITIATE REDUCTION, CONTROL AND EMPOWERMENT OF THE PATIENT WITH LYMPHOEDEMA

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Introduction: Treatment options over the last decade have allowed for the supervised management of patients through a reduction phase of treatment. In addition, the pandemic has been the instigator of change from traditional Decongestive Lymphatic Therapy (DLT), to self-reduction using wraps (and pumps), and movement and drainage. Increased awareness and education has allowed for people living with lymphoedema to assist in their management achieving treatments in a more cost effective way.

Aim: Treatment programmes for DLT have been slow to evolve, with treatment protocols, including daily multi-layer bandaging, manual lymphatic drainage, skin care and exercise, being defined as best practice. More recently, the introduction of wrapping systems, and new electrotherapies means that patients can reduce their limb volume with the correct support, education and supervision, improving the cost burden to the NHS. To evaluate if changing treatment programmes will produce similar or better results from that gained from traditional DLT whilst empowering the patient and saving resources.

Method: Following a holistic assessment including limb volume, tissue and psychosocial, patients were provided with a suggested treatment programme consisting of a Velcro wrap, exercise and drainage and supporting information. Planned care was daily wearing of wrap, reducing and tightening as necessary, and exercise, movement and self-lymphatic drainage advice. In addition, some were offered pneumatic compression as home use. 10 patients were reviewed weekly via telephone or video call and reassessed, supported or treatment adjusted. They underwent a face to face review consultation where objective measurements we evaluated and ongoing care prescribed.

Results: All patients had an improvement in limb volume, tissue texture and psychosocial, demonstrating a simpler and comprehensive treatment program can achieve reduction, through therapsit supervision and support.

Conclusions: Through assessment and evaluation, supervised self-reduction programmes can reduce lymphoedema with with a cost saving benefit whilst ensuring the patient is empowered to self-manage their treatment and lifelong condition.

[P25] HOW DOES POSITION OF THE LEG AND PHYSICAL ACTIVITY INFLUENCE EDEMA REDUCTION IN LOWER LIMB LYMPHEDEMA DURING COMPRESSION TREATMENT? - A CASE STUDY

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Introduction: Multilayer compression bandaging is the most important component in the initial management of lower limb lymphedema(1)Spain (2). However, compression bandaging may be a burden to patients and time consuming for health care professionals. Therefore, efforts to reduce treatment time are important. Fukushima et al. have described how a single bout of active exercise on a bicycle ergometer combined with short stretch bandages were more effective in volume reduction in lower limb lymphedema than compression therapy only(2). The results may not apply to normal treatment regime with compression bandaging 24 hours a day, but no existing data can confirm this.

Aim: To investigate which impact position of the leg and overall physical activity has on edema reduction during compression treatment with coban2 in 2 patients with lower limb lymphedema.

Method: The case study will present data on 2 patients receiving initial lymphedema treatment for cancer-related lower limb lymphedema at an outpatient clinic. The patients have signed written consent and participates in a trial, in which a new device (CIMON) is tested.

The device (CIMON) is a circular stretch-band with a sensor attached, which is placed at the widest circumference of the edematous lower leg before compression bandaging is applied. The device registers stretch of the circular band and temperature. In addition, patients wear the Sens Motion sensor at the thigh, which provides data on position of the leg and movement. Data from both devices will be transferred by Bluetooth technology from an app on a smartphone to a secured cloud-based server.

Patients have been encouraged to elevate the leg when sitting, but they have not been advised to change their daily activities during the lymphedema treatment.

Data on volume reduction measured by perometry and changes in extracellular fluid registered by tissue dielectric constant and bioimpedance spectroscopy will be collected and analysed with data from the devices and self-reported activity.

Results: At present, data collection is ongoing. Results will be presented at the ILF conference.

References:

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[P26] OPTIMIZED IPC TO IMPROVE DECONGESTION AND QUALITY OF LIFE IN PATIENTS WITH LEG EDEMA OF VARIOUS ORIGINS

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Introduction: Intermittent pneumatic compression (IPC) is an important option in decongestive therapy for leg edema. Patients with phlebedema and lymphedema suffer from a compromised quality of life.

Aim: To improve decongestion of patients leg edema and increase quality of life. The IPC was therefore performed with a special wrapping applied over the patient's leg.

Method: As part of a prospective study, the extent of the volume reduction in the legs in patients with leg lymphedema is determined. Decongestion was enabled with a special foam wrapping around the leg under the cuff of the IPK (twelve-chamber device, Lymphamat 12, Bösl Medizintechnik GmbH, Aachen). In the maintenance phase, medical compression stockings were worn. Volume of the legs was monitored throughout with the help of the 3D body scanner BODYTRONIC 600. Further target criterion of the study concerned the health-related quality of life, therefore the validated questionnaires TLQ-CVI and DLQI were used.

Results: Inclusion of 18 patients (mean: 63.9 years, SD 16.7 years, 27-83 years, 9m: 9w). The IPK resulted in a volume reduction (in L) of the thighs (left / right) of -0.12L / -0.125L (2,08% / 2,67%), the lower leg (left / right) of -0,13L / -0.165L (3,7% / 4,77%) achieved. Additional volume reduction through the use of the foam wrapping on the thigh (left / right) of -0.085L / -0.135L (2,07% / 2,97%) and on the lower leg (left / right) of -0.075L / -0.08L (2,49% / 2,11%). After the transition to the maintenance phase and supply of medical compression stockings, the volume increased again without reaching the initial values before IPK. Quality of life based on 12 patients who received the wrapping: The physical complaints improved in the decongestion phase from 2.19 (before decongestion) to 1.04, in the maintenance phase increase to 1.23. Patients were limited in everyday life before decongestion: 5,75 VAS. This improved to 2,94 VAS. The general well-being was also limited (e.g. rapid exhaustion, problems coming to rest): Before decongestion in mean 5.75, which improved to 3.04 in the end of the decongestive therapy.

Conclusions: Leg edema lead to a significant reduction in quality of life. This can be significantly improved with adequate therapy. We monitored a non-significant deterioration in quality of life in the outpatient maintenance therapy. The wrapping of the legs increases the decongesting effectiveness of the IPK. Medical compression stockings reduce the re-swelling of the legs in the maintenance phase.

[P27] IMPROVING LYMPHOEDEMA IN AN OBESE PATIENT WITH RECURRENT CELLULITIS

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Introduction: This Case Report is about a 61-year-old gentleman who developed Stage II lymphoedema in his lower right leg secondary to recurrent cellulitis and subsequent obesity in 2015. As the patient's limb got larger after each infection, his mobility worsened and his obesity increased creating a vicious circle. His medication included prophylactic antibiotics to prevent further episodes of recurrent cellulitis. Despite wearing appropriate compression post decongestive lymphatic therapy (DLT), the patient experienced some rebound of swelling.

Aim: The treatment aim was to compare a JOBST® Confidence garment with the patient's previous compression garment in terms of their ability to maintain the limb shape and size, comfort, fit and breathability, and to evaluate any improvement in the texture (softening) of the tissues.

Method: The patient was prescribed a new made-to-measure flat-knit compression class 3 JOBST® Confidence knee-high stocking designed with a unique Contour-Fit Technology. The observation period was 3 weeks. Parameters assessed included wearing time, tissue condition and limb volume. Several self-reported perceptions of JOBST® Confidence were assessed including fit and shape, comfort, ability to remain in place, compatibility with exercise, and breathability.

Results: The patient's adherence to the stocking was very good as he wore it for 14 hours every day. At the end of the observation period, his tissues around the ankle and calf had improved greatly and were much more soft and supple. The leg shape was much better too as was the overall size with a volume reduction of 922 mL. The self-reported patient rating of JOBST® Confidence was as follows: the patient was 'very satisfied' with the fit and shape of the stocking and rated its wearing comfort as 'very comfortable'. The ability to stay in place, to allow to take part in exercises and the breathability of the stocking were all rated as 'very good'. The patient stated that compared to his previous garment, the new stocking performed better in these areas.

Conclusions: The aim of treatment was achieved. Despite initial rebound after transitioning to compression post-DLT, use of JOBST® Confidence garment, the limb measurements reduced so much that the leg was even smaller than it was after completing DLT. In conclusion, the results indicate that innovative garments can maintain and even optimize the limb size post-DLT, helping to improve tissue texture and reduce the rebound effect after transition to the maintenance phase.

[P28] THE SURVEY OF CLINICAL ACTIVITIES AND EDUCATIONAL NEEDS OF HEALTH PROFESSIONALS MANAGING GENITAL OEDEMA: NATIONAL DATA-BASE IN JAPAN

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Introduction: Various health professionals are involved in the management of lymphoedema. Manual lymphatic drainage (MLD)/massage and lymphoedema therapists have received training on treating lymphoedema and specialise in lymphoedema management. Oedema of the extremities is emphasised in educational training and is widely practised. Conversely, educational programmes have not been established for therapists and other professionals on genital oedema; therefore, they have insufficient training.

Aim: This study aimed to compare clinical activities and educational needs for therapists and non-therapists who specialise in lymphoedema management regarding the genital oedema in Japan.

Method: In this study, MLD/massage and lymphoedema therapists were included in 'therapists', and nurses, physiotherapist, physicians/surgeon, and so on were included in 'non-therapist.' The participants of this study were therapists and non-therapists who manage lymphoedema. The survey asked respondents to describe their experience working with managing genital lymphoedema. The questionnaire queried the confidence they had in their knowledge of genital oedema, their previous training and their education needs regarding managing genital oedema. Chi-square tests were used to compare the backgrounds of therapists vs non-therapists. The educational needs of therapists and non-therapists were summarised. This study was approved by the ethical review board at Kanazawa University.

Results: The survey included 70 health professional respondents in Japan, of which 45 (64.3%) were therapists and 25 (35.7%) were non-therapists. The results revealed even therapists who had received special training in lymphoedema management but did not use assessment scales for genital oedema. In the therapist group, more participants had received training on genital oedema ($p < 0.01$), but 34 (75.5%) were trained for less than four hours and only two (4.4%) received training for treating genital oedema in children. Forty-four participants (97.8%) described 'Skin care and reducing infection risk' and 'Compression and support garments' as essential to education for treatment of genital oedema. For non-therapists, 19 participants (76.0%) described 'Common pathologies' and 'Compression and support garments' as essential.

Conclusions: Even therapists who had received special training on lymphoedema management did not utilise an assessment scale and most of them did not receive training on genital oedema in children. Regarding educational needs, therapists need information on specific treatment methods. Non-therapists also need information on specific

treatment methods but also basic knowledge such as 'Common pathologies.' The results of our study can aid the education of health professionals to provide appropriate genital oedema management.

[P29] SUPPORT AND COMPRESS (SAC) STUDY CAN THIS BE KEPT PRIVATE - SCROTAL EDEMA IN TRAUMA PATIENTS

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Introduction: Clinical intervention of scrotal edema in the trauma patient has essentially been ignored. Literature on scrotal edema in an acute care setting with traumatic injuries is limited and there are no standard of care models. Recognizing the need for intervention, we adapted lymphedema principle of decongestive lymphatic therapy components (DLT): compression, elevation, therapeutic exercise, deep breathing and manual lymph drainage to treat scrotal edema patients in the acute care setting focusing on traumatic injuries.

Aim: Adapted (DLT) intervention was implemented with the aim of improving patient outcomes. These include functional mobility; decreasing ICU, ventilator and urinary catheter days; decreased pain levels and scrotal size.

Method: This is an observational study of 41 patients, 25 interventional and 16 standard of care. The primary objective of this study is to compare the current standard of care (DLT) intervention on pain level, scrotal size, incidence of UTI, catheter days and functional mobility in trauma patient with scrotal edema. Therapists were trained in the adapted (DLT) intervention appropriate for this study.

Patients with scrotal edema were identified and verbally consented to participate in the interventional cohort of the study. Patients were assessed daily for pain level, scrotal size (circumference and vertical U measurement) and scrotal appearance description. Additional data collection include number of therapy days, ventilator days, incidence of urinary tract infections, ICU days, patient demographics and mode of injury.

Results: Recruitment of 25 interventional and 16 standard of care patients completed therapy and the data has been analyzed. Data shows statistical significance in edema and pain reduction with (DLT) intervention. Therapy was initiated with the aim of improving patient outcomes by increased functional mobility; decreasing ICU, ventilator and urinary catheter days; decreased pain levels and scrotal size.

Conclusions: We hope to introduce a standard care model and initiate practice change in the treatment of acute scrotal edema. During the study, modifications of inclusion/exclusion criteria along with improved measurement technique were implemented. This created better objective perimeters in patient selection and data collection. Initiation of procedural changes in treatment of scrotal edema will be implemented as a standard of care practice model. Future studies are under development.

[P30] COMPRESSION THERAPY IN MALE GENITAL LYMPHEDEMA - NEW IDEAS - 2 CASE STUDIES

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Introduction: Surgical treatment of prostate cancer may involve removal of lymph nodes in the peritoneum, which can cause lower limb lymphedema (LLE), but also genital lymphedema (GL). Additional radiotherapy may increase the risk of GL but also metastatic prostate cancer(1,2).

The incidence of LLE among patients with prostate cancer have been estimated to be 4 %⁽²⁾ whereas the incidence of secondary male GL remains unknown, .

For patients it is a complicated and debilitating condition having to live with GL. However, patients may find it hard to address the problem Health care professionals may also focus on LLE only and avoid assessment and treatment of the GL(3).

Aim: Compression bandaging/therapy in genital LE remains a challenge in LE management.

The poster will present 2 cases with examples of easy applicable compression techniques with a good fixation at the genital area.

Method: **Cases**

Case 1: A 63-year old male with LLE and GL following surgical and radiological treatment of prostate cancer.

Case 2: A 82-year old male with LLE and GL due to metastatic prostate cancer.

Technique case 1:

The scrotal area is covered with Coban2/coban2 lite as suggested by 3M. In addition, a 10 cm wide Coban 2 comfort and compression layer is wrapped around each thigh and covers the perineum to get a good fixed compression from below. The penis is bandaged with coban2 lite 2,5 cm or tubular gauze. Treatment every weekday is recommended because new bandage should be applied each day due to hygienic issues.

Bandage should be with a minimum of stretch around the thighs to secure flow in the lymphatic system.

Technique case 2:

The patient was provided with a 21 cm wide tubular gauze cut with a hole to the head and pulled through the legs supporting the perineum and scrotum. The bandage could be regulated with a knot in front and combined with extra padding covering the scrotum.

The technique is safe, easy applicable and is suitable for patients in palliative care.

Results: Both patients received compression bandages on the lower limb combined with compression of the genital area. Reduction of GL were succesfull in both cases with good patient compliance.

Conclusions: Reduced GL has given the patients the feeling of increased quality of life because of efficient working compression therapy.

[P31] CLINICAL RELEVANCE OF QUANTIFYING PELVIC LYMPH NODES FOR PREDICTING AND TREATING GENITAL LYMPHEDEMA.

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Introduction: Anatomical quantitative research on the lymph nodes (LN), especially the pelvic region, is inadequate. According to Földi, Standring, Moore, Hsu, and Itkin, there are between 41-154 LNs in the pelvic region (Inguinals-Lumbar) based on reported mean values across several studies and textbooks. This range should be considered too large for a surgeon to decide how many LNs to remove for diagnosing and/or treating cancer without causing unnecessary harm or for a lymphedema therapist to explain expectations of involvement or improvement to a person with lymphedema.

Aim: A more precise understanding of the innate average numbers of LNs in a region and the number of LNs removed can help guide a therapist's treatment with genital lymphedema. Knowledge of the exact LNs removed, can also assist the therapist in utilizing specific muscles to aid in pumping fluid from an involved region to an uninvolved region. The pelvic floor muscles are located in close proximity to 4 of pelvic LN groups (Iliacs and Sacral).

Method: A study on 43 cadavers was completed to quantify the number of pelvic LNs based on anatomical landmarks. Another quantitative and qualitative study was previously conducted by the author (DiCecco, 2012) to assess volumetric reductions and quality of life (QOL) improvements with targeting portions of the pelvic LN via pelvic floor muscle contractions in treatment of 10 females with lower extremity lymphedema with and without genital involvement.

Results: Cadaver demographics were 27 female, 16 male, 39 Caucasian, 3 African American, 1 Asian, an age range of 42-102 and a mean of 70. Cadavers (N=43) inspected for lumbar LN and cadavers (N=86 sides) inspected for sacral, common, deep and superficial inguinal, and internal and external iliac LN. The cadaveric study found a true mean range [CI=95] of 54-77 LNs in the pelvic region. The treatment study found significant reduction [$p=0.006$, $\alpha=0.05$] in volume and significant improvement [$p=0.035$, $\alpha=0.05$] in QOL.

Conclusions: Reducing the mean range of LNs in the pelvic region should positively impact the medical community and patients. This is particularly true for lymphedema therapists treating those post cancer treatments in the pelvic region. Improved expectations for outcomes can be provided if the therapists know the number and location of the LNs removed during diagnosis and/or treatment by the physician. Therapists can incorporate muscles near the removed LN in treatment to help reduce edema and improve QOL for cancer survivors.

[P32] THE INTER-RATER RELIABILITY OF THE NEAR-INFRARED FLUORESCENCE LYMPHATIC IMAGING TO EVALUATE THE LYMPHATIC SYSTEM OF THE UPPER LIMB: AN OBSERVATIONAL STUDY.

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Introduction: The Near InfraRed Fluorescence Lymphatic Imaging (NIRFLI) is found effective for real time evaluation of lymphedema. The NIRFLI is a subjective evaluation method because the evaluation of the images is based on the interpretation of the images by the assessor. It is important to know if different assessors interpret the results in the same manner. The level of agreement between the assessors is called 'inter-rater reliability'. To be able to implement the NIRFLI in the clinical practice for evaluation of the lymphatic system, determination of the inter-rater reliability is important to assess the level of agreement. Reliability studies of this imaging technique are missing.

Aim: Therefore, the aim of this study is to investigate whether two different assessors can evaluate the lymphatic architecture and transport through NIRFLI in a reliable way.

Method: Two assessors evaluate independently the lymphatic architecture and transport through one session of NIRFLI. Several items are compared: the presence of transport of lymph out of the injection sites, the presence and severity of dermal backflow pattern, the presence of draining pathways and the presence of lymph nodes.

To determine the level of agreement between the evaluation of the two assessors, the Cohen's Kappa is used for the nominal variables, for the ordinal variables the Weighted Cohen's Kappa is used and for the continuous variables the Intraclass Correlation Coefficient is used.

Results: Eight participants are assessed. Two participants have lymphedema stage I, four have stage IIa and two stage IIb. The difference in edema volume between the healthy arm and the affected arm varies between 3,5% and 25,5%. There is a moderate to very good agreement of the presence of transport from the injection site (56,3% to 100%). The interpretation of the dermal backflow patterns varies between no agreement and a perfect agreement (WK= .200 and WK= 1.000). The agreement of the visualization of the efferent lymphatic vessels is weak to moderate depending on measurement time (25% and 36%) and the agreement of the visualization of lymph nodes is very good (100%).

Conclusions: Overall there is an average to good degree of agreement between the evaluation by the two assessors when evaluating the lymphatic architecture and transport through NIRFLI.

[P33] LYMPHEDEMA: WHAT DOES LYMPHOFLUOROSCOPY BRING US?

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In lymphology, clinical examination is essential and requires experienced practitioners. Currently, the practitioner has additional means of investigation developed to document lymphatic disorders. Lymphoscintigraphy has recently been joined by indocyanine green lymphofluoroscopy (ICG).

Lymphofluoroscopy is a simple, minimally invasive, reproducible technique, lower cost and more sensitive to lymphoscintigraphy, which is very useful for detecting subclinical lymphedema, confirming its clinical presence, assessing its severity and serving as a guide for the practitioner for complex decongestive therapy and also in cases where surgical treatment can be offered.

[P34] DETERMINATION OF ANXIETY LEVELS IN LIPEDEMA PATIENTS, EVALUATION OF BODY PERCEPTION AND SELF-ESTEEM

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Introduction: Lipedema is characterized by swelling and expansion of the lower extremities because of abnormal accumulation of subcutaneous fat tissue. Continuing abnormal fat accumulation despite diet and exercise is a cause of disappointment. Reduced mobility of patients, difficulty finding suitable clothing for their bodies, inability to use seating places in public areas are problematic. Anxiety in patients, and body perception disorders can play a role in the progression of the disease.

Aim: The aim of our study is to evaluate body perception and self-esteem in patients with lipedema and to determine whether anxiety levels are high in these patients.

Method: Our research was planned as a cross-sectional clinical trial. A total of 107 lipedema patients with follow-up in the lipedema unit of T.C. Health Sciences University Istanbul Physical Therapy and Rehabilitation Training and Research Hospital and 107 healthy adult individuals as control group were evaluated. Records of all lipedema patients were kept for anamnesis and clinical findings. Both groups were subjected to sociodemographic form, Beck's anxiety scale, scale of body perception and Rosenberg self-esteem scale.

Results: The mean age of the patient group was 49.0 ± 13.0 , and the mean age of the control group was 48.1 ± 13.4 . There was no significant difference between the two groups in terms of mean age. ($P > 0.05$) The education levels and monthly earnings of patients with lipedema are lower. ($P < 0.05$) Beck anxiety score was found to be high in patients with lipedema. ($P < 0.05$) Positive correlation was detected between lipedema and Beck anxiety scores. ($P < 0.05$) In terms of Rosenberg self-esteem, there was a significant difference between the two groups. People with high self-esteem were found to be more in the control group. ($P < 0.05$) As the lipedema phase increased, it was determined that self-esteem decreased. ($P < 0.05$) Body perception scale scores were found to be low in patients with lipedema. ($P < 0.05$) Body perception scale scores decreased as lipedema phase increased ($P < 0.05$)

Conclusions: Anxiety-related complaints are observed more commonly in patients with lipedema than in the normal population. Lower education levels and income status of these patients may be the result of lipedema. The body perceptions of patients with lipedema have been negatively affected and their self-esteem is low. The negativity caused by lipedema puts patients in a vicious cycle of psychosocial problems. The necessary arrangements should be made for psychological support for patients with lipedema.

[P35] COMPRESSION GARMENTS IN LIPEDEMA; FITTING, COMPLIANCE AND BENEFITS: A SURVEY.

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Introduction: The use of compression garments in lipedema patients aims to reduce edema, improve symptoms and prevent progression, but there are currently no guidelines to prescribe them.

Aim: To investigate the experience, compliance and perceived benefits of compression garments in lipedema patients

Method: An online survey was designed

Results: 161 patients completed the survey, median-age 42 (range:19-74); BMI 28.6 (95%CI:27.5-29.7). Half of the patients were at stage 1 or 2. Diagnosis of lipedema was made by Lymphedema specialist (55.8%), Cosmetic Medicine (30.5%) and self-diagnosis by Internet information (13.6%). Concerning the characteristics of lipedema, 4.4% did not know the type, and 13% the stage of their disease. The use of compression garments was reported by 87.6% of the patients. Garments were prescribed by Rehabilitation doctor (37.3%), Vascular surgeon (30.4%), 17.4% bought their garments without any medical prescription, or others (14.9%). Twenty-three-percent did not know the fabric of their garments; and 31.1% the compression class. Self-perceived fitting was Good or very good in 62.7% and Bad or very bad in 37.3%. The fitting was bad or very bad in 42.9% of patients that bought them without medical prescription. No association was observed between the fitting and the fabric nor the class of the garments. Fitting was better in custom-made garments than in standard garments ($p=0.046$). Only 52.8% of the patients wear their garments daily, and 67.7% during more than 8 hours/day. The better the fitting, the better the compliance to garments ($p<0.0001$). Almost half of those who reported a bad or very bad fitting, only wear the garments never or 1-2 times a week, whereas 38.2% with good or very good fitting, wear them daily. ($p<0.0001$). Compliance to garments was not related to age, but was better in patients with a lower BMI ($p=0.002$). The benefits patients perceive with the use of garments were: reduction of edema (78.9%), of pain (65.8%), of fat (60.9%), of heaviness (55.9%), and to avoid progression (5.0%). The edema reduction was related to a better fitting ($p=0.007$), and wasn't associated to the fabric nor the class of the garments.

Conclusions: Although lipedema is gaining more and more visibility, misinformation among the patients is a fact.

The use of garments is beneficial for lipedema patients in the edema and pain reduction, but this depends on the fitting, as well as patient's compliance to them. More research is needed to adjust the prescription to the real patients' needs.

[P36] LIVING WITH LIPOEDEMA, LIPOSUCTION AND OTHER TREATMENTS LIPOEDEMA UK'S SURVEY 2021 FOR LIPOEDEMA UK'S RESPONSE TO THE NICE REVIEW ON NON-COSMETIC LIPOSUCTION

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Introduction: Lipoedema is a loose connective tissue (fat) disease in women causing a disproportionate increase of fibrotic and painful subcutaneous adipose tissue on the lower body and arms which is resistant to reduction of both size and symptoms such as pain and heaviness by dieting or exercise. In recent years many patients have opted for non-cosmetic liposuction to reduce the volume of affected areas and improve painful and debilitating symptoms. The majority of the liposuction procedures have been self funded

NICE are a national UK body whose role is to improve outcomes for people using the NHS and other public health and social care services by producing evidence-based guidance and advice to Health and Care Practitioners.

Lipoedema UK were invited to respond to the The National Institute for Health and Care Excellence (NICE) consultation on non-cosmetic Liposuction in managing Lipoedema guidance.

Aim: To collate data on symptoms and Quality of Life (QOL) issues affecting women with Lipoedema. Compare symptoms and QOL pre and post operatively for liposuction patients as well as comparing the severity of symptoms and QOL with patients who had not had any surgical treatments.

Method: Lipoedema UK devised an online study using Survey Monkey to canvas the experiences of women with Lipoedema who had or were planning liposuction to treat lipedema either in the UK or abroad.

The study asked a total of 102 questions, divided into subgroups including diagnosis, motivation, preparation, effectiveness, benefits and post operative complications of liposuction and other treatments.

The study was advertised to Lipoedema UK membership and contacts via email newsletters and social media. There was a strict window of time of 2 weeks to respond.

Results: There was an instant and overwhelming response to the first email resulting in 351 people completing the survey in the first 3 days. Ultimately over 930 responded, 756 from the UK. The average time to complete the survey was 30 minutes. Many women wrote copious comments to express their despair and frustration at the lack of treatments and describe how increasing pain and reduced mobility burdened their everyday life, career prospects and mental health.

Conclusions: 254 respondents to Lipoedema UK's survey had either had or are scheduled to have non-cosmetic liposuction. This data collected provides compelling statistics on the reasons patients choose non-cosmetic liposuction and the results on their symptoms and QOL for Lipoedema UK's submission to the NICE review.

[P37] DEGREE OF SATISFACTION TO PERFORM SELF-CARE AND EFFECT USING PNEUMATIC PUMP IN A HOME SETTING FOLLOWING LIPEDEMA

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Introduction: Lipedema is a genetically induced and a painful abnormal deposition of fat in the extremities of women. The pathogenesis is unclear but often develops during puberty, pregnancy and menopause which indicates that oestrogen might contribute to its development. Performing daily care and avoiding pain is necessary and time consuming for individuals with lipedema.

Aim: The aim of this study was to evaluate user satisfaction with the Intermittent pneumatic compression (IPC) device and service. The aim was also to evaluate the potential difference in easiness performing self-care and effect on pain with or without the device.

Method: 66 women diagnosed with lipedema, referred to the edema unit at rehabcenter Sfären participated between 2012 and 2019. All had gone through a try-out routine for IPC with sleeve for bilateral legs and abdomen and had used the device for 1 - 1.5 years in their home setting. The Quebec User Evaluation of Satisfaction with assistive Technology was used for follow up. Two study-specific questions with Visual Analogy Scales, (VAS) was asked. VAS was also used for 45 of 66 women to find if there was any reduce of pain.

Results: Estimated satisfaction with the assistive device at the follow up was: m= 4.42 (max 5.00) for the device characteristics, m= 4.60 (max 5.00) for service and m=4.49 for total Quest 2.0. The three most import items identified were effectiveness (26,2 %) easy to use (23,2 %), and follow up (13,3%).

For 64 of 66 women it was easier to perform selfcare with the IPC and for 56 women it was over 50% improvement. 60% out of 45 women reported reduce in pain with 50% or more and 30% experienced pain reduction with 80% or more after one year.

Conclusions: IPC can provide a satisfying method for selfcare and reduce pain in the home setting, for individuals with lipedema.

[P38] YOUTUBE AS A SOURCE OF INFORMATION ON LIPEDEMA: A QUALITY AND QUANTITY ASSESSMENT

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Introduction: Lipedema is a chronic progressive which has difficulties in diagnosis and treatment. YouTube provides information on several health-conditions including lipedema.

Aim: The aim of this study was to investigate the characteristics, quality and quantity of YouTube videos on lipedema.

Method: We explored YouTube using the key word lipedema and sorted the videos using the filter 'sort by view count'. Of the initial videos, the top 50 videos were included to review. Source, channels and domains of videos were determined. The number-of-days since upload, number of views, likes, dislikes, duration of videos and video power-index were recorded. A modified DISCERN tool and global quality scale were used to assess the reliability and quality of videos and evaluated by two lymphedema specialists.

Results: The top 50 videos had a mean of 35805 views, 282 likes, 12 dislikes, 63.8 viewing rate and 30 comments. The mean video power-index (96.4) and viewing rate (63.8%) were high. The videos were generally uploaded by health-professionals mostly for patients and health professionals as target populations. The majority of video contents was related with general information (68%) followed by surgical treatment (62%) and patient experiences (40%). 82% of the videos were determined as useful and majority of them demonstrated moderate to good quality. The mean DISCERN score was higher in the health-professional group compared to non-health professionals. There was an excellent inter-rater reliability and very strong compliance between both observers.

Conclusions: Lipedema videos represent a useful tool with moderate to good quality but they are not sufficiently reviewed to obtain standard quality. Health professionals specialized on lipedema/lymphedema should be aware of the limited nature of YouTube videos and provide up-to-date and peer-reviewed content of websites in order to avoid misleading information and to improve the educational value of them.

[P39] CLINICAL AWARENESS AND KNOWLEDGE OF LIPEDEMA AMONG A GROUP OF PHYSIATRISTS IN TURKEY

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Introduction: Lipedema is a chronic metabolic disorder of the adipose tissue and is marked by a bilateral and symmetrical swelling of the extremities, caused by extensive deposits of subcutaneous fatty tissue.

Aim: The aim of this study was to determine the awareness and knowledge of lipedema among a group of psychiatrists regarding its symptoms, treatment and management in Turkey.

Method: The participants were asked to answer a 5-minute web-survey, including 23 questions. In addition to their demographical and logistic properties, the questionnaire elicited data on knowledge, education and awareness of the psychiatrists on diagnosis and treatment of lipedema. Descriptive statistics were presented in means (\pm SD) or median [min - max] for normally distributed continuous variables or percentages and number for categorical outcomes. All analyzes were performed with SPSS 22.0.

Results: One hundred and twenty female and 41 male psychiatrists completed the survey. 68.3% of the participants were aged between 31-50 years. Most of the participants (75.2%) were working in big cities and 55.3% of the participants were working in tertiary hospitals. The percentage of the participants who said that they were knowledgeable about lipedema was 26.7%.

Seventy nine percent of the psychiatrists reported that they have evaluated and treated <10 patients over the last 12 months. 81.4% of the psychiatrists had low level of knowledge on current scientific literature about the factors that predispose lipedema development. 91.9% of the participants had attended less than 2 conferences, workshops, seminars or other educational events related lipedema generally in the past 5 years. Most physicians stated that lipedema was different from lymphedema and obesity. However, detailed knowledge about lipedema treatment was low, as 77.7% of the psychiatrists reported that they have no comprehensive information about complex decongestive therapy. Furthermore, awareness about the efficacy of other physical therapy modalities on lipedema was also low. Nearly half of the participants did not believe that once lipedema has clinically manifested, a patient can eventually be cured of the condition. 93.4% of the physicians determined that there needs to be greater education and awareness of current literature about lipedema.

Conclusions: The awareness and education about lipedema are low among Turkish psychiatrists. Increasing clinicians' awareness and education about lipedema is crucial in order to increase the quality of care and quality of life.

[P40] THE IMPACT OF PANDEMIC COVID-19 LOCK-DOWN ON PATIENTS WITH LIPEDEMA

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Introduction: The restrictions due to COVID-19 pandemic begun in March 2022 and limited the facilities of several out-patient clinics in order to prioritize the care of COVID patients, until to the first days of June 2020. All these limitations and precautions have influenced access to health care of several patients with chronic illnesses, including a challenge to the management of patients with lipedema.

Aim: The aim of this study was to assess general health conditions and to evaluate the problems and concerns of lipedema patients in regard to access to care and provision of management and control follow-ups, during the lockdown period between March-June 2020.

Method: A web-based online-survey which included questions about demographical/clinical properties, compliance- to-restrictions, needs, difficulties on access to health care as well as presence of psychological-symptoms, was called from the Facebook page of lipedema patient group.

Results: Two-hundred-and-eleven females replied to the survey. Majority of them (85%) were between 18-50 years-old and had high school/university education (75%). The duration of lipedema was more than 6 years (78%) in majority of them and, type and stage were commonly 3 (64%) and 2 (53%) respectively. A great number of them adhered to stay-home warnings (91%).69% of the females reported weight-gain and skipped self-care methods (87%). 46.5% of them needed to apply health-centers to renew pressure garment but could not reach. More than 80% of patients had sleep-disorders and anxiety/stress disorders. Majority of patients used social-media (83%) and/or television (78%) to get information related with COVID-19 and the exposure time was more than 2 hours in 90% of them.

Conclusions: The COVID-19 lock-down had a great impact on lipedema patients' healthcare not only from medical but also from the psychosocial aspects. All these implications have to be identified and dealt with properly to avoid concerns and consequences for future pandemic-lock-down. Medical services should be well prepared to deliver virtually, enable effective care and share knowledge in order to meet the needs of patients suffering from lipedema.

[P41] ADEQUATE TREATMENT OF LIPEDEMA

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Introduction: Lipedema is a chronic, often progressive swelling of the adipose tissue in certain places on the body that causes pain and a local dysfunction in the lymphatic vessels of the adipose tissue resulting in severe tissue fibrosis that reduces the ability to lose the tissue by diet, exercise, or even bariatric surgery.

The American physician Frances Xavier Dercum described Dercum's disease in the late 19th century, some 50 years before lipedema was described by Allen and Hines in 1940. However, the taking of one for the other and the ensuing misdiagnosis has occurred between the two populations long after the 1940s because both diseases have painful adipose tissue. The forms of treatment for the two diseases have also converged using method for treating lymphedema, which provides little results to improve the fibrotic tissue associated with lipedema.

Aim: To find out best treatment for people with fibrosis and lipedema.

Method: TeamDercum, established in 2015, an association of researchers and practicing medical lymph-therapists in Sweden, with interest in adipose tissue diseases and Lymfterapi Norrort with over twelve years of experience, have been researching and practicing best treatments for persons with lipedema and Dercum's disease. Manual deep tissue therapy has been used to reduce fibrosis in the tissue of people with lipedema. Lymfterapi Norrort and others also performed studies with intermittent pneumatic compression (IPC) treatments that, among other things, showed good reduction of pain and easier mobility in people with lipedema.

Results: Lipedema tissue cannot be treated just with manual lymphatic drainage therapy as lymphedema, which has been common practice in the past. Lipedema must also be treated differently from Dercum's disease due to the localized lipomas in Dercum's disease. With the help of the Standard of Care of Lipedema in the United States, TeamDercum and Lymfterapi Norrort will present their experience with patients with lipedema and Dercum's disease, showing positive results after treatments such as deep tissue massage for lipedema, IPC treatments, special compression garments, healthy eating and for some patients even liposuction removal of the tissue.

Conclusions: Lipedema tissue cannot be treated just with manual lymphatic drainage therapy as lymphedema, which has been common practice in the past. Lipedema must also be treated differently from Dercum's disease due to the localized lipomas in Dercum's disease.

[P42] A HOLISTIC ASSESSMENT FOR PATIENTS WITH LIPEDEMA; IMPROVEMENT FOR PATIENTS AND HEALTH CARE PROFESSIONALS

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Introduction: According the proposed paradigm shift on lipoedema from the European Lipoedema Forum, we created a more holistic assessment for lipoedema patients. This holistic assessment does not only focus on the diagnostic and medical aspects of the disease, but also takes the impact on daily functioning and participation into account. Every lipoedema patient has her specific individual health issues. In order to establish this overall picture, a health care professional can create a patient's health profile on all domains of the International Classification of Functioning, Disability and Health (ICF). The health profile should contain objective measurements to clarify the patient's personal history and identify specific individual needs.

Aim: The primary aim of the study is to set up an optimal personalized treatment plan for patients with lipoedema. The secondary aim is to investigate if the new diagnostic and treatment approach will lead to more positive outcomes in lipoedema care within the Dutch Center of Expertise for Lymphovascular Medicine in Nij Smellinghe Hospital, Drachten, the Netherlands.

Method: To create a more complete health profile, we added questionnaires of physical, psychological and dietary origin to the existing standard intake. To investigate the patients, health-related physical activity the IPAQ questionnaire was used. Patients with a low physical activity level performed the 6MWT. Patients with a moderate or high physical level performed a Steep Ramp Test. The Dutch standard of normal activity was questioned to monitor daily activity level. Muscle strength was measured with the MicroFETÖ. A Visual Analogue Scale was used to measure pain and fatigue. A pain score > 4 points led to the fulfilment of the CSI questionnaire. If the fatigue was scored >4, we asked the patient to fill in the MVI questionnaire. To assess problems on psychological level the 4DKL questionnaire was used. To investigate dietary problems, we used a Dutch Eating Habits questionnaire and patients filled out a food diary, one week prior to the appointment in our center.

Results: Preliminary results of the first 3 months of the new approach will be presented.

Conclusions: This is the first study with multidisciplinary measurements in all domains of the ICF to give a better insight in problems in patients with lipedema. We expect this will lead to a more specific treatment strategy.

[P43] A CASE REPORT ON THE EFFECTS OF THE LIPO + PLUS MULTILASE DEVICE IN THE TREATMENT OF LIPOEDEMA.

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Introduction: The Lipo + Plus MULTILASE (LPM) device is a low-level laser that employs light energy to improve the clinical outcome in lipoedema patients. It induces temporary changes in the cell membrane permeability of adipocytes, thus leading to adipocyte deflation, with more than 99% of the intracellular content (including stored fat) being released (Niera et al, 2002, *Plast Reconstr Surg*110(3):912-922). Adjacent nonadipocyte cells within the treated interstitial space and capillary structures remain intact, highlighting a unique result distinct to adipocytes. This observed effect occurs without upregulation of inflammation or decline in fat cell viability (Jackson et al 2009: *Surg Med* 41(10):799-809). The device is further indicated to assist healing processes after injuries/lesions and to reduce acute or chronic muscle and joint pain. Evidence reports beneficial effects in soft tissue healing and inflammation (Jackson et al, 2009: *Surg Med* 41(10):799-809).

Aim:

- **Study objective:** to assess the beneficial effects of the LPM in the treatment of lipoedema patients.
- **Primary study goal:** pain reduction in joints and muscles.
- **Secondary study goals:** inflammation reduction, skin tissue softening, blood circulation / lymph flow improvement.

Methods:

- **Patients:** N=8, female, lipoedema or lipo-lymphedema, 30-70 years of age.
- **Treatment:** Application of the LPM twice a week for three weeks (same time, same weekday).
- **Measurements:** Fat, muscle and fluid distribution were assessed via bioimpedance analysis (Sozo Device). Body circumference was measured with a standard tape measure. Standardized exercises were performed to assess patient flexibility and mobility. Assessment of pain and mobility was done by use of a 1-10 scale.

Results:

After a three-week treatment with the LPM, the patients demonstrated on average:

- a decrease in the pain score (1-10 scale, 10 maximum pain) from 5.9 to 3.1;
- an increase in the mobility score (1-10 scale, 10 lowest mobility) from 6.1 to 3.9;
- a 1.9 cm limb circumference decrease.

Conclusions: All patients benefited from the three-week treatment with the LPM, all showing positive changes in mobility and pain levels (knees, hips, ankles). The observed decrease in limb circumference confirms previous studies (Jackson et al 2009: *Surg Med* 41(10):799-809) and could also be explained by the increase in mobility and reduced pain levels that was achieved with the LPM. Thus, the LPM device offers clear benefits for all stages and types of lipoedema as a complementary treatment, by way of enhancing mobility through joint and muscle pain reduction.

[P44] SUBSTRATUM DEPTHS IN LIPOEDEMA

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Introduction: Subcutaneous depth varies in lipoedema, depending on site and stage. Compression garment-fitting for pain control is aided by sonography, even if not yet a tool for diagnosis. The subcutaneous layer of skin (subcutis) in lipoedema appears to be composed of a deeper, more echo-dense layer (substratum) corresponding to the more vascular and fibrous histological appearance above muscle fascia, and deep to the more superficial echo-poor fatty layer.

Aims: Audit should quantify differences between lipoedema patients and normals in subcutaneous skin layers thicknesses. If significant, could this contribute to present debates about lipoedema?

Method: Health Insurers require justification for costs of compression hosiery. High resolution (18 MHz) ultrasounds are securely stored in patient records. For the audit, with patient permission, copies were anonymized apart from date and diagnosis (LipO/non-LipO), with depths compared at the anterior mid-point midline thigh in 50 lipoedema and 50 unaffected similar practice patients.

Results: Fluid was never seen. Unexpectedly the subcutaneous echo-poor (more fatty) 0.2 cm depths in the lipoedema patients were significantly less than in 'normal' patients (0.4 cm). The ratio echo-poor substratum to echo-dense substratum was 1:10 in lipoedema patients versus 1:1 in normals.

Discussion: These unanticipated findings apply to a lipoedema population, highly motivated to exercise frequently and intensively, maintain diet and weight, and wear well-fitted compression hosiery, perhaps with inserts. The ratio echo-poor substratum to echodense substratum could be one of the diagnostic markers for the diagnosis of lipoedema. Further studies are needed.

Conclusion: Continuity of care and quality criteria using diagnostic equipment (high-resolution ultrasound) facilitates criteria for "piling on the pressure" for preventative and symptomatic treatment in lipoedema. Ultrasound may be demonstrating subcutaneous fat reduction in lipoedema patients using compression hosiery, weight control and exercise. Further work should confirm that increased echodensity is correlated with pain/tenderness for targeting areas needing extra pressure.

As no oedema was seen in the thigh of any patient, perhaps the emotive terminology "lipO" is justified for effectively treated "syndrome of fat legs and orthostatic edema (Allen, Hines 1940)".

[P45] LIPOEDEMA OR OBESITY; DO NOT OVERLOOK THE DOUBLE BURDEN OF MALNUTRITION. A CASE STUDY.

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Introduction: In many cases the treatment of the lipoedema patient, especially when it is in combination with obesity, focusses on weight loss and the promotion of a healthy lifestyle. We raise the question if that is always an adequate approach, especially when we take the recommendations of the recent published European consensus document on lipoedema and the literature about sarcopenic obesity into account.

Method: A 50 year old obese woman with a Turkish ethnic background was referred to our Center of Expertise for Lymphovascular Medicine for diagnostics and treatment. Prior to referral she was diagnosed with lipoedema and obesity and had already undergone bariatric surgery. After the bariatric procedure she had lost 46 kgs of weight, but still her BMI was 58,8. She had developed a severe reflux with frequent vomiting since the surgery. She showed a negative attitude towards eating. Her main question was to be able to walk again, while the enormous lumps on the medial side of her upper thighs were obstructing a normal gait pattern.

Results: Our assessment, consisting of a CT scan focussing on muscle mass of the lower extremity, bio-impedance analysis, grip strength, functional tests and dietary intake, indicated loss of muscle (-function). The conclusion of our team was that sarcopenic obesity was her main medical diagnosis and we could not confirm the diagnosis of lipoedema yet. Sarcopenic obesity faces the double burden of malnutrition and this diagnosis must lead to another dietary approach. We have chosen for a conservative therapeutical approach as first step, aiming at improvement of her nutritional status by a specific diet, medication to reduce her reflux and building up the muscle mass by physical therapy. We focussed on isocaloric and a high protein diet with high vitamin density of the nutritional intake. Special attention was paid to her eating attitude, more appreciative towards nutrition to improve her health and to facilitate exercise and activities to gain muscle mass and less focussed on weight loss.

Conclusions: Our case report underlines the importance of a proper medical diagnosis with accompanying health profile on all domains of human functioning. From the perspective of the dietician, data about body composition provided relevant information to choose the proper treatment. The cooperation between the participants in the ECL was very important, mainly between the dermatologist, dietician and physiotherapist.

[P46] GLOBAL HEALTHCARE PROFESSIONAL'S PERSPECTIVE ON LIPEDEMA/LIPOEDEMA

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Introduction: Lipedema is a loose connective disease in women causing a disproportionate increase of fibrotic and painful subcutaneous adipose tissue on the lower body and arms. There are suggestions in the lipedema community of a new paradigm that denies the presence of edema in lipedema. There is also debate if mental health issues precede the development of pain in the lipedema tissue or vice versa, whether lipedema tissue can progress, what effects liposuction has on lipedema tissue, and if women with lipedema primarily have or should have a diagnosis of non-lipedema obesity, or if it is a co-morbidity, and what outcomes bariatric surgery can have on complete and effective lipedema treatment.

Aim: Determine global healthcare provider opinions on topics in the lipedema community by online questionnaire.

Method: A questionnaire consisting of ten demographic and housekeeping questions and eleven questions on lipedema will be sent to European and North American professionals, using SurveyMonkey. Respondents are asked to score their answers based on the GRADE system: Strong (Grade 1) or Weak Recommendation (Grade 2), referencing benefits, risks, burden, and cost, and the degree of confidence in estimates of benefits, risks, and burden. We also ask respondents to rate the quality of evidence as high (Grade A), moderate (Grade B), or low (Grade C) according to the risk of bias, precision of estimates, the consistency of the results, and the directness of the evidence. Papers providing a background to each issue are available for respondents on a website link. Data from the questionnaire will be exported and analyzed by country and globally.

Results: The following list of topics are included in the questionnaire.

1. Edema in lipedema tissue.
2. Lipedema tissue pain.
3. Mental health and development of pain in lipedema.
4. Progression of lipedema.
5. The effect of exercise on lipedema tissue.
6. The effect of diet on lipedema tissue.
7. The effect of bariatric surgery on lipedema tissue.
8. The effect of lipedema reduction surgery on body weight and fat tissue mass.

Conclusions: The pathophysiology of lipedema is poorly understood. The authors feel it is too soon to make final decisions on pertinent issues. Hearing from the global community about controversial areas in lipedema will be enlightening and may improve education, research, and clinical care.

[P47] LYMPHATIC IMPAIRMENT IN PATIENTS WITH LIPOEDEMA MAY BE INDEPENDENT OF FAT ACCUMULATION AND DISEASE STAGING BUT CORRELATES WITH SYMPTOMS DURATION

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Introduction: Lipoedema, a chronic and progressive disease characterized by abnormal fat distribution resulting in disproportionate, painful limbs and mainly affecting women, can be associated with lymphatic impairment.

Aim: To describe the anatomy and functioning of lower limb superficial lymphatic system by using indocyanine green (ICG) lymphography in patients with lipoedema.

Method: Patients with stage I to III lipoedema undergoing ICG lymphography and body composition assessment by dual-energy X-ray absorptiometry (DXA) between January 2015 and March 2020 were included. After injection of ICG at the dorsum of the foot, fluorescent images were traced, and distance (cm) covered by the dye after 10 (T10') and 25 minutes (T25') was measured and adjusted for limb length. If the dye did not reach the groin within 25 minutes, patients were classified as slow group (SG). Abnormal ICG lymphography patterns including dermal rerouting and dermal backflow were assessed. Values of fat and lean regional distribution assessed by DXA were extracted, and correlation analysis between variables was performed.

Results: A total of 45 subjects were included in our study. Mean age was 39 years, and mean BMI was 29.48 kg/m². Mean duration of lipoedema symptoms before diagnosis was 23.4 years. Disease severity was classified as stage I in 10 patients (22.2%), stage II in 22 patients (48.9%), and stage III in 13 patients (28.9%). All subjects had a normal ICG lymphography pattern. Overall, 25 patients (55.6%) were classified as SG. Only symptoms duration (mainly pain) before diagnosis was significantly associated with SG status at multivariate analysis. No statistically significant difference was found among types and stages of lipoedema in terms of adjusted T10', adjusted T25', and SG. Spearman's analysis showed a reasonable negative correlation between adjusted T25' and symptoms duration ($r_2 = 0.220$; $r = -0.469$; $p = 0.037$), while no robust correlation was found between ICG lymphography and body composition parameters.

Conclusions: Our study suggests a progressive slowdown in lymphatic flow in patients with lipoedema, which seems to be dependent on symptoms duration rather than the amount of fat or disease staging. These findings underline the importance of early management in patients with lipoedema, in order to avoid evolution towards lipo-lymphedema at any stage of the disease.

[P48] INITIATIVE FOR THE ESTABLISHMENT OF NATIONAL LYMPHOEDEMA FRAMEWORK CROATIA

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Introduction: In 2021, the University Department of Health Studies, University of Split, suggested an initiative to establish National Lymphoedema Framework Croatia (NLFC). Advocating lymphoedema awareness amongst healthcare professionals and the public showed a significant interest to acknowledge importance of lymphoedema management and its implementation in the national healthcare system.

The Croatian healthcare is lacking in basic lymphoedema care standards, starting from deficiency of trained staff, undersupply in clinics' equipment, unestablished national guidelines, and absence in the provision of compression garments. These factors are impacting the population in need who are already facing prolong waiting for a referral to specialists, and high expenses patients need to cover themselves.

Aim: Forming of the NLFC will enhance evidence-based lymphoedema management in Croatia. This initiative will further help in setting up collaboration in South-Eastern Europe towards mutual involvement in the improvement of lymphoedema quality of care.

Method: In the past three years, the healthcare sector in Croatia organized a range of different activities to raise the awareness of the importance of lymphedema treatment and its potentials on a national level. Congress in "Lymphoedema, lipoedema and chronic wounds" has been held every year, four times heretofore, discussing the better quality of care on a national basis.

The NLFC initiative started with supporting the education of healthcare professionals in the management of lymphoedema and lymphatic disorders. It followed with launching an online survey, which led to setting up a basic database in the monitoring of lymphoedema cases. The Croatian initiative established a stakeholders' network and promoted preventative programs agreed upon amongst healthcare professionals and community representatives across the country.

Results: An educational activity based on knowledge-share experience delivered so far, helped in building a better and more transparent lymphoedema community across Croatia.

Rising voice about public prejudices and individual acceptance of compression garments was promoted via photography exhibition in Split in 2021, supported by the University of Split Institutions, Croatian PMR Society and lymphoedema patients' volunteers.

Croatian clinicians worked on the translation of the Best Practice for the Management of Lymphoedema to set up a national consensus in lymphoedema management.

Conclusions: Establishing the NLFC will help the Croatian healthcare system to increase the importance of lymphoedema care and its promotion. Upcoming projects suggested across universities, hospitals, societies, and patient support groups came across encouraging feedback. By joining the international lymphoedema community, the

NLFC will be able to build a knowledge-share platform and contribute the future projects.

[P49] UNCOVERING THE PATIENT JOURNEY FOR DUTCH PATIENTS WITH PRIMARY LYMPHEDEMA

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Introduction: Patients with a rare disease experience difficulties in diagnosis¹. Anecdotal evidence suggests that for parents with children with lymphedema one of the biggest challenges is accessing treatment². Currently a patient journey, a way to identify the steps a patient takes and the challenges they experience for patients with primary and pediatric lymphedema is lacking in Europe. As the Dutch patient representative in the European Patient Advocacy group (ePAG) in the Paediatric and Primary Lymphedema (PPL) working group of the European Reference Network on Rare Multisystemic Vascular Diseases (VASCERN) I spearheaded a patient journey project starting in the Netherlands.

Aim: To identify the difficulties in diagnosis, access to treatment including self-management in the Netherlands.

Method: Interview based qualitative research. An interview template was created with the collaboration of the PPL ePAG, the support network of EURORDIS and clinicians of the Center of Expertise for Lymphovascular Medicine (ECL) Nij Smellinghe. To create a non-biased data set patients were collected via ECL, the Dutch patient society, the Dutch societies for Edema therapists (Physical- and Skin therapists). Patients were interviewed via phone.

Template content:

- Age, gender, type of lymphedema, compression, cellulitis episodes
- The phases
 1. First symptoms
 2. Research & testing
 3. Diagnosis
 4. (First) treatment
 5. Follow-up care
- Self-management, knowledge, self-efficacy
- Most memorable positive and stressful experiences

Results:

35 patients (or their parents) participated: eight under the age of 10, two aged between 10 and 18, the rest aged above 18. On average it takes six years to get a correct diagnosis. The young children were diagnosed within a year. The level of self-management of the parents is enormous, very often families have a special daily routine for skin care, massages and bandaging.

Conclusions:

Being a patient and mother myself it was a moving experience. It were very open and heart-to-heart interviews.

Quotes: "I really loved my compression garments being measured, as the lady would always ask me what animal she should draw on my leg afterwards. And I loved animals"
"My grandmother always knitted a compression garment set for my favorite stuffed animal"

1 Emily Muir, Rare Disease UK: The Rare Reality – an insight into the patient and family experience of rare disease (2015)

2 Quéré I, Moffatt C. (2010) ILF - Care of Children with Lymphoedema

[P50] A SYSTEMATIC REVIEW: A SYSTEMATIC REVIEW OF LITERATURE TO CREATE AN EVIDENCED BASED GUIDELINE FOR THE DIAGNOSIS, ASSESSMENT AND MANAGEMENT OF LYMPHOEDEMA USING THE NICE METHODOLOGY.

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Introduction: A research team was commissioned to work with healthcare staff to form a Guideline Development Group (GDG) and provide leadership and governance. Work Stream Groups (WSGs) were formed with members from varied, relevant professional backgrounds.

Aim: To develop an evidence-based, standardised guideline for lymphoedema diagnosis, assessment and management following international research standards practice.

Method: A systematic review of published guidelines and studies examining lymphoedema was undertaken to answer clinical questions in PICO format. A search was performed using PubMed, Embase and CINAHL. This search covered articles published up until May 2021. Only human studies and articles written in English were included. References in recent reviews were also examined. Results were reviewed by the WSGs, and recommendations generated. All searches and screening were conducted independently by each WSG, each with at least 4 reviewers which increased confidence that all relevant and current evidence were identified for the review. There were 41 members of the WSGs including service user representation and there was service user representation on the guideline development group and for all consultations.

Results: An evidence based clinical practice guideline was developed to aid clinicians in the diagnosis, assessment, and management of lymphoedema. Overall clinical practice recommendations were formulated based on the evidence available to answer each clinical question. Recommendations were assigned a grade based on the strength of the evidence. In the absence of sufficient evidence and in an effort to maximize clinical applicability, recommendations were also based on expert opinion which was gathered via guideline member consensus. The 'GRADE' system was used to grade evidence. Two internal consultations were completed before a third external consultation. The external consultation included a wider group in Ireland and the UK. The document was amended to suit feedback and reviewed before final formatting and publication.

Conclusions: The objective of this guideline is to provide healthcare professionals with clear, evidence based guidance on the diagnosis, assessment and management of patients with all types of lymphoedema. The recommendations from the guideline should be communicated at all levels regarding responsibility for implementation in clinical care and service development. Audit should be a core component of the implementation. A budget impact analysis should be completed to determine additional costs required to fully implement the guideline.

[P51] CONTINUOUS MONITORING OF CHRONIC EDEMA WITH STRETCH SENSOR "CIMON1" (CIRCUM-FERENCE MONITOR) DURING A BANDAGING PROCEDURE IN GLADSAXE MUNICIPALITY

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Introduction: Chronic edema of the lower extremities is common and may lead to leg ulcers and infection. The primary treatment is reducing the edema through compression bandage treatment, followed by secondary edema management with compression stockings. The bandage should be changed at intervals as the edema is reduced and the bandage becomes too loose.

The CIMON1 sensor is designed to monitor edema continuously over time, to optimize the bandaging treatment. The data from CIMON1 is presented in a webapp.

Aim:

- Determine if the treatment with compression bandages can be optimized via monitoring of the edema.
- Examine whether monitoring of the edema can reduce the total treatment time due to change of bandage as needed, rather than routinely.
- Examine whether users (citizens / home care) experience greater satisfaction and safety with constant monitoring of edema during a compression treatment course.

Method: The project will follow 15 citizens in Gladsaxe Municipality during their primary treatment for edema of the lower extremities.

All 15 are equipped with the CIMON1 sensor, so that their treatment may be monitored by the lcompression staff and wound nurses in Gladsaxe municipality.

Patients with chronic edema are eligible if circumference at the widest circumference of the calf is ≥ 35 and <70 centimeters.

Patients with ulcers or infections within 5 cm from the widest circumference of the calf, are excluded from the test.

After the CIMON1 sensor is placed on the patient's leg, the edema and ulcers are treated as usual, with bandages on top of the sensor.

The CIMON1 sensor will monitor the patients 24/7 and give nurses information regarding change in the circumference of the calf and change in temperature. The nurses will look at the data at least once a day and determine whether the bandage treatment is still effective. When the bandage is changed, they will document the change in circumference, and register the change in the webapp.

The data from CIMON1 is collected in the webapp, together with the notes from the nurses. Safety and adverse events will also be evaluated.

Results / conclusion: At present, data collection is ongoing. Results will be presented at the ILF conference.

[P52] AN OVERVIEW OF 21ST CENTURY WEARABLE SENSOR-ENABLED COMPRESSION TECHNOLOGY INNOVATIONS FOR LYMPHATIC, VENOUS, AND SPACE APPLICATIONS

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Introduction: Healthcare globally is going through a seismic shift. As our population continues to grow, the unmet clinical and patient needs grow as well. Recently, wearables and smart technology have become seamless in their interaction with our daily lives. With covid-19, remote and connected medicine has accelerated innovation and improvements in healthcare. Wearables have thus far focused on diagnostic applications. Recent developments in wearable therapeutics with sensor-based technologies have demonstrated great potential to transform lymphatic, venous, and space applications. Here, we will cover the various ways smart wearable therapeutic technologies are bringing these fields into the 21st century.

Aim: An overview of 21st century wearable therapeutic compression technology and innovations for lymphatic, venous, and space applications.

Method: A complete overview of smart textiles, sensors, smart materials such as shape-memory materials that can be weaved into clothing and garments. A detailed review and breakdown of how these technologies work and the engineering innovations that are integrating diagnostics with therapeutics and connected care.

Results: Advances in wearable technology including smart garments, sensors, active compression, and digital connectivity are reviewed in detail to provide the lymphedema community with a deep sense of transformation available with 21st century tools to advance care for chronic diseases such as lymphedema and chronic venous disorders. We also present options to integrate active compression therapy with diagnostic potential for the future of connected home-based care. Examples with connected wearable therapeutics that allows custom treatments, sensing, and remote monitoring are discussed.

Conclusions: Wearables are transforming various aspects of human life and medicine, including remote monitoring and diagnostics across several fields in medicine from cardiology, orthopedics, eye-care, etc. Wearable therapeutics with active compression and sensing have the potential to bring lymphedema and venous care to the 21st century.

[P53] IMPROVEMENT OF LIMB VOLUMES AFTER BARIATRIC SURGERY IN NINE END STAGE PRIMARY AND SECONDARY LYMPHEDEMA PATIENTS, A MULTIPLE CASE REPORT

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Introduction: The relationship between obesity and LE is plural and bi-directional. Obesity and postoperative weight gain are known significant risk factors for the development and aggravating of secondary lymphedema, as well as for poor control of chronic edema. Several studies described negative effects of morbid obesity on the lymphatic system and suggest extreme obesity as a novel cause of LE, so called "obesity-induced LE". Finally, several intervention studies targeting lymphedema by weight management and dieting demonstrate positive results.

Aim: Bariatric surgery offers the most effective and durable treatment for obesity with positive effects on obesity related diseases. We raised the question whether bariatric surgery could improve leg volumes in morbid obese LE patients. Until now, a small number of studies described the benefits and potential benefits of bariatric surgery for the treatment of LE in extreme super obese patients, with a BMI high above 50 kg/m².

Method: Between 2013 and 2019, 9 patients treated in our Center of Expertise for Lymphovascular Medicine for their LE have undergone a bariatric procedure, related to their morbid obesity. Their data concerning medical diagnosis, type of bariatric treatment, BMI and limb volumes were retrospectively collected from the patient files.

Results: Two of the nine patients were diagnosed with secondary LE, four with late onset non hereditary LE and three with obesity induced LE. Mean pre-operatively BMI was 44 with a range of 40 to 56 kg/m². We observed robust improvements in leg volumes after bariatric surgery in all nine morbid obese end stage LE. At groups level the mean percentual reduction of BMI was 28,2%, the volume of the left leg reduced 31,1% and of the right leg 29,2%. These reductions were statistically significant, mean length of follow up was 39,3 months.

Conclusions: Our data underline the chances for new treatment options for morbid obese patients with end stage LE, primary, secondary and obesity induced of nature. More research is needed to prove this concept. It is preferable to include a broad range of measurements including medical diagnosis, BMI, lymphatic function, body composition and daily activity level.

[P54] INCREASED EFFECTIVENESS IN INTERMITTING PNEUMATIC COMPRESSION

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Introduction: The Method Morand is a further development of intermitting pneumatic compression (IPC) called IPC+.

Aim: Significant improve the amount of decongestion in patients with lymphangiological edema by a defined padding underneath the intermitting pneumatic compression.

Method: Method Morand: a defined padding underneath the IPC with special foam cubes filled in muffs entirely covering the edema area.

Results:

- significantly improved amount of decongestion in patients with lymphangiological edema by redistributing fluids
- decongestion effects can be achieved in areas that previously had not been possible with conventional IPC treatment
- hardened swellings, as can occur with a lymphostatic fibrosis at an advanced stage, can be softened and decongested

Conclusions: Not only does a defined padding underneath the intermitting pneumatic compression (IPC) significantly improve the amount of decongestion in patients with lymphangiological edema by redistributing fluids. The practitioner of this method has several years of experience in this field and observed its effects in patients for the first time in 2015. The method is generally used as an adjuvant therapy to Complex Decongestive Physiotherapy and can often accelerate the conventional decongestive therapy. Moreover, decongestion effects can be achieved in areas that previously had not been possible with conventional IPC treatment. Hardened swellings, as can occur with a lymphostatic fibrosis at an advanced stage, can be softened and decongested with this technique. Patients with edema caused by trauma tolerated the treatment surprisingly well without pain. The practitioner described the use of the treatment on patients in detail and published his findings on the website www.methode-morand.de.

[P55] DISCUSSION OF THE PROTOCOL OF A MULTICENTRE PRAGMATIC, RANDOMISED AND CONTROLLED TRIAL COMPARING RECONSTRUCTIVE LYMPHATIC SURGERY VERSUS NO SURGERY, ADDITIONAL TO A CONSERVATIVE TREATMENT OF LYMPHOEDEMA

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Introduction: The first choice of treatment of lymphoedema is a conservative treatment, that consists of skin care, compression therapy, exercises and manual lymph drainage. Reconstructive lymphatic surgery is also often performed: i.e. lymphovenous anastomoses or a lymph node transfer. By (partially) restoring the lymphatic transport, the reconstructive surgery may possibly lead to a larger decrease of the lymphoedema volume and therefore greater discontinuation of the compression garment. Consequently, patients will have an improvement in functioning and quality of life. Currently, scientific evidence for reconstructive lymphatic surgery is missing.

Aim: To investigate the added value of reconstructive lymphatic surgery in addition to the conservative treatment, for the treatment of lymphoedema.

Method: 180 participants with upper (n=90) or lower limb lymphoedema (n=90) stage 1-2b will be recruited in three hospitals in Belgium: UZ Leuven, UZ Gent and CHU UCL Mont-Godinne. All participants will be randomised in an intervention group receiving reconstructive surgery and conservative treatment or a control group receiving conservative treatment. All subjects are assessed at baseline (shortly before surgery/ no surgery) and at 1, 3, 6, 12 and 18M post-baseline (primary endpoint) and at 24 and 36M. Primary outcome is lymphoedema-specific quality of life. Secondary outcomes are: general health related quality of life, change of volume, failure to reduce the hours a day of wearing the compression garment, duration and experience of wearing compression garment, admission for intensive treatment, body weight, work capacity and ability, recurrence of cancer, infection rate, lymph transport and costs related to lymphoedema and its treatment. All participants receive conservative treatment: first 6M of skin care, manual lymph drainage, exercises, wearing compression garment 16h/day and education in self-management; then 6M of the same conservative treatment, however the hours a day of wearing the compression garment is gradually decreased; thereafter 6M of self-

management; and finally, 18M of follow-up. Only the subjects of the intervention group receive reconstructive lymphatic surgery. The surgeon performs lymphovenous anastomoses, lymph node transfer or a combination. The method of surgical procedure is based on the result of the pre-surgical investigations as ICG lymphofluoroscopy, lymphoscintigraphy, lymph MRI and CT angiography. If the reconstructive surgery is effective, a cost-effectiveness analysis will be performed. This trial has been funded by KCE – the Belgian Health Care Knowledge Center (KCE-191245).

Conclusions: This trial will give us a clear answer on the research question about the added value of reconstructive lymphatic surgery to the conservative treatment of lymphoedema.

[P56] ASSESSMENT OF LOCAL TISSUE WATER MEASUREMENTS (TDC) IN THE HEAD AND NECK AREA OF HEALTHY PARTICIPANTS: TEST-RETEST RELIABILITY

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Introduction: Lymphedema is a frequent but understudied late effect after head and neck cancer. Compared to lymphedema in the limbs, measurement of head and neck lymphedema, which is vital to select appropriate treatment and monitor progress, is challenging. In other areas, measuring with the tissue dielectric constant (TDC) technique has been studied and shown promising results. Its applicability in the head and neck area is yet unknown.

Aim: This study aims to determine the test-retest reliability of a TDC measurement protocol using the Lymphscanner developed for the head and neck area, in healthy participants. Additionally, we assessed the usefulness of triplicate measurements to improve reliability.

Method: We developed a detailed measurement protocol including 8 measurement points. Measurement locations are located temporal, at cheek and jawline (above and below mandibular bone), and at three points in the neck. All points are related to easily distinguishable anatomic landmarks. Measurements are taken on both sides of the face, except for the submental measurement point.

We recruited a convenience sample of 50 healthy participants (28 male), all over 45 years of age, who did not have facial hair or inflammation-associated skin conditions. We used the Lymphscanner (Delfin, Finland) to measure TDC and estimate Percentage Water Content (PWC) at all points. We performed two measurement sessions, measuring each point three times per session, with a minimum of 30 minutes between test and retest sessions. Test-retest reliability for each point was evaluated using intraclass correlation coefficients (ICC) and standard errors of measurement (SEM).

Results: The mean age of the participants was sixty years (SD 7.0), and the mean Body Mass Index was 27.9 (SD 4.6). The reliability of the single measurements was moderate to excellent for all measurement points (ICCs 0.58-0.87), with generally low measurement error (SEMs 1.65-3.39). The lowest ICCs were found for the temporal (single left 0.73, right 0.67) and submandibular (single left 0.58, right 0.77) locations. Using the average of the three measurements improved reliability to 'good to excellent' for all points (ICCs 0.81-0.95), leading to smaller measurement errors (SEMs 1.52-2.86).

Conclusions: Measurements with the Lymphscanner, taken according to the developed protocol, are reliable in healthy participants. We recommend measuring all points as the average of three measurements to optimize reliability. The developed protocol is fit for further testing in patients with head and neck lymphedema.

[P57] EXPLORING THE HEALTH ECONOMIC IMPACT OF USING TECHNOLOGY IN THE ASSESSMENT OF LYMPHOEDEMA

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Introduction: No study exists determining the health economic impact of the different methods of lymphoedema measurement. This Tenovus Cancer Care funded study is part two of three.

Aim: To determine which methods of lymphoedema measurement (Circumferential Tape Measure (CTM), Perometer, Bio-impedance and self-report questionnaire) is most cost-effective and time-efficient for both the National Health Service (NHS) and people with lymphoedema.

Method: A purposeful cohort of 84 adults with unilateral limb lymphoedema secondary to cancer were recruited. Ethical approval gained. A unique session included a patient self-report questionnaire, 4cm CTM, limb volume measurement by perometer, and bio-impedance with Bodystat Quadscan 4000 and L-Dex® U400. All methods were performed with a researcher and assistant, and timed from commencement to completion of the measurement. Health economic analysis was performed.

Results: The fastest method was Perometer at 1 minute, 47 seconds; and the longest was the BodyStat Quadscan at 3 minutes, 56 seconds. The cheapest measurement by a therapist was the L-Dex (Sozo) at £0.58, and the most expensive was Bodystat Quadscan (£1.13). The most cost-effective method for clinical use was CTM (£1.11).

Conclusions: CTM remains the more cost-effective method of measuring lymphoedema due to its versatility in clinical practice, i.e. can be used in various settings; and is not limited to patients 'At Risk' of lymphoedema. Although economically justified a further study needs to establish if CTM is as effective in practice compared to other methods.

[P58] EXPLORING PATIENT PERCEPTIONS OF THE LYMPHOEDEMA ASSESSMENT METHODS

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Introduction: No study exists that has considered a patients' self-report on the severity of their lymphoedema, nor of their perceptions of the different types of lymphoedema assessments available. This Tenovus Cancer Care funded study is part three of three.

Aim: Explore patient self-report of their lymphoedema and their perceptions of lymphoedema measurements including Circumferential Tape Measure (CTM), Perometer, Bio-impedance and self-report questionnaire.

Method: A purposeful cohort of 84 adults with unilateral limb lymphoedema secondary to cancer were recruited. Ethical approval gained. A patient self-report questionnaire was completed, limb volume measurements taken by 4cm CTM and Perometer, and two types of Bio-impedance were performed (Bodystat Quadscan 4000 and L-Dex® U400). Participants completed a post-session questionnaire regarding their preferences. Statistical analysis included descriptive statistics and paired-sample *t*-tests.

Results: Seventy-five people with upper and nine with lower limb lymphoedema were recruited; mean age of 64 years. Self-report had 45% describe their lymphoedema as 'Mild' and 33% 'Moderate'. Conversely, on measurement, 24% were 'Mild', and 28% 'Moderate', with biggest group 'At Risk' (33%).

Participants' preferred method of measurement was the Perometer as it was considered fastest and easiest to perform. Severity of lymphoedema had been discussed with 71% at previous appointments, and 79% felt it was 'very important' that their severity was explained. Measurements not taken at appointment would worry 63% of the patients.

Conclusions: Measuring is an integral part of lymphoedema assessment especially as self-perceptions of lymphoedema severity were overestimated. Explanation of measurement results is vital to alleviate distress and correct misperceptions.

[P59] PATIENT-REPORTED OUTCOME MEASURES WITH SECONDARY LOWER LIMB LYMPHEDEMAS

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Introduction: Patient-reported Outcome Measures (PROMs) are measures of patients' health related quality of life (QoL). PROMs guarantee patient-centered evaluation and serve as distinguishing tools for disease detection. Lymphedema often leads to a restriction in QoL given the disease and a considerable amount of following comorbidities. PROMs should be added to other lymphedema measurements, such as volume calculation. With an improved disease-free survival of secondary lower limb lymphedema (LLL), attention must focus on LLL assessments.

Aim: To locate and appraise suitable PROMs for LLL and to search for German versions.

Method: A systematic literature research with the keywords (lower limb edema OR lower limb oedema OR leg lymphedema OR leg lymphoedema) AND (patient reported outcomes OR patient reported outcome measures OR patient-centered outcomes OR questionnaire) was conducted. 20 semantical categories for qualitative analysis were evolved inductively out of the text.

Results: Six questionnaires remained for analysis.

In the past, generic instruments were used to assess health-related QoL in LLL patients with questionable outcome because of reduced patient centering.

Patients with LLL show a worse QoL than patients with arm lymphedema. The most critical denominators affecting the QoL were: numbers of experienced cellulitis, presence of pain, skin quality and a restricted range of motion, respectively. To establish adequate skin care and prevent episodes of cellulitis, patients must learn about skin problems. This is considered crucial because of knowledge-building and prophylaxis behaviour. Questions for movement restrictions were found in two questionnaires. As they have a close connection to one's ability to perform activities of daily life, they can affect QoL.

Afflicted patients have problems with choice and availability of clothing. Obesity further compromises the choice. Only three questionnaires offered questions about clothing/shoes. Lymphedema patients are exposed to more psychological stress than healthy subjects. Only two questionnaires covered the psychological burden.

There was a lack of reporting for psychometric data, which hinders the external validity.

Conclusion: Analysed questionnaires were in English, only one in German. They were different in length, scope, style and focus. No recommendation can be given for a certain tool. There was a lack of reporting for psychometric data. There is a need for validated lymphedema questionnaires in German.

Deng, J. et al., 2013. Self-reported information sources and perceived knowledge in individuals with lymphedema. *Lymphology*, Dec;46(4), 173-183.

Ridner, S. H., 2009. The Psycho-Social Impact of Lymphedema. *Lymphatic Research & Biology*, Vol. 7, Nr. 2, 109-112.

[P60] COMPARATIVE ANALYSIS OF STIFFNESS AND CONTAINMENT IN A NOVEL LYMPHEDEMA GARMENT

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Introduction: Throughout the course of lymphedema treatment, consistent compression and containment is critical to achieve optimal outcomes. Often, channeled foam is applied to break down fibrotic tissue and encourage lymph fluid movement. Current practice such as short-stretch compression bandages paired with foam does not allow for independent adjustments by the user as volume reduction occurs. Easy to don, Adjustable Compression Devices with a high level of stiffness allow for independent use to maintain containment throughout treatment.

Aim: A novel inelastic garment paired with a channeled foam liner was designed to provide containment for the lower extremity and massage fibrotic tissue to promote fluid movement. The garment provides stiffness for containment and applies compression over the foam liner to further the massaging effect of the channeled chip foam. The 10cm of adjustability is easy for the patient to readjust as often as needed. The design of this garment provides improved donning and comfort empowering independent use to maintain containment throughout the day.

Method: Evaluating the stiffness of lymphedema treatment methods provides insight on the level of containment for the extremity. A feasibility test was conducted with 7 users to collect insights on adherence and clinical observations.

Results: Adjustable Compression Devices consistently measure at a higher stiffness compared to short stretch bandages and circular knit garments. 86% of patients reported that the garment was easy to apply with 100% reporting an accurate fit with no gaps or buckling. Clinical observations included 6 out of 7 patients reporting a visual reduction in swelling after wearing the garment and 50% of wearers noting improvement in skin and tissue texture.

Conclusions: The high level of stiffness and containment provided by the outer inelastic wrap paired with the channeled foam liner promote fluid movement and a visible reduction in swelling throughout lymphedema treatment. The comfortability and ease of independent use allow the user to adjust the garment throughout the day, thereby producing positive clinical outcomes.

[P61] ADVANCED TRANSLATION AND CULTURAL ADAPTION OF THE LYMPH-Q UPPER EXTREMITY MODULE FROM ENGLISH TO DANISH

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Introduction: To better quantify the impact that breast cancer-related arm lymphedema (BCRL) has on health-related quality of life (HR-QOL) a disease-specific patient-reported outcome measure (PROM) is needed. The LYMPH-Q Upper Extremity Module was recently developed for patients with BCRL.

Aim: The aim of this study was to perform an advanced translation and culturally adapt the LYMPH-Q Upper Extremity Module for use in Denmark.

Method: The LYMPH-Q Upper Extremity Module was translated into Danish according to the guidelines of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) and the World Health Organization (WHO). The process included two forward and one back translation, an expert panel meeting, and cognitive debriefing interviews with patients. The focus of the translation was to develop a Danish version that used appropriate patient-friendly language while maintaining the meaning of the items, instructions and response options.

Results: The two forward translations resulted in minor differences in terminology. These discrepancies were discussed among the translators and a harmonized Danish version 1 was achieved. Comparison of the back translation to the original English version identified 14 items/instructions/response options that required re-translation. Subsequently, experts helped to identify and resolve the language for 10 items/instructions/response options that did not maintain the same meaning as the English version. Participants in the cognitive debriefing interviews did not report any difficulties with understanding the items/instructions/response options.

Conclusions: The translation and cultural adaption process led to the development of a conceptually equivalent Danish version of the LYMPH-Q Upper Extremity Module.

[P62] ULTRASOUND ELASTOGRAPHY ASSESSMENT OF LYMPHOEDEMA TISSUE BEFORE AND AFTER THE PITTING TEST: AN INSIGHT INTO TISSUE STIFFNESS

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Introduction: Palpation assessment is susceptible to discrepancy between therapists with technique, sensitivity to detect subtle changes, and the accuracy of assessment reliant on therapist experience, skill, and knowledge. Measurement of lymphoedema tissue stiffness with ultrasound elastography enhances understanding of why the superficial skin and soft tissues feel how they do and distinguishing features between presentations.

Tissue stiffness relates to how the skin and underlying tissue layers feel in response to applied pressure. The benefit of tissue stiffness measurement using ultrasound elastography is that tissue stiffness of the different layers within the image can be quantified.

Aim: This study investigates the use of ultrasound Acoustic Radiation Force Impulse (ARFI) elastography to quantify tissue stiffness of lymphoedema tissue and determine the qualities present in tissues that pit.

Method: Eight unilateral arm lymphoedema participants had ultrasound elastography imaging before and after a 60 second staged pitting test. Imaging was performed using the Siemens Acuson s3000 ultrasound device with a 9MHz transducer with elastography capability. All elastographic maps were generated with a 2cm standoff and ultrasound conductive gel between the transducer, standoff, and skin surfaces.

Results:

Pre-test and post pitting patterns

Lymphoedema tissue exhibited a heterogenous elastographic map compared to non-oedematous sites at pre-test. The lymphoedema tissue stiffness patterns varied greatly relative to the contralateral site; however, most lymphoedema tissues responded to the pitting test in the same way.

Change in tissue stiffness

The pitting test caused a reduction in tissue stiffness across most sites and tissue layers. The dermal layer tissue stiffness reduced post-test for all eight participants, with a significant correlation between pre-test and post-test dermal elastography measures (Pearson correlation 0.914, $p < 0.001$). The average reduction in dermal stiffness was -1.064 m/s, ranging from -0.340 to -1.790 m/s. Subcutaneous stiffness reduced post-test in seven of the eight sites assessed with the change ranging between -0.550 to +0.800m/s. The magnitude of change in tissue stiffness varied considerably between the few sites involved in the group.

Tissue layer border integrity

The integrity of the dermal-subcutaneous tissue layer border was associated with stiffness dissipation and pitting depth post-test. Greater deterioration of the border had greater pitting depths. Tissue layer border integrity was not defined by lymphoedema tissue composition of the dermal or subcutaneous tissue layers.

Conclusions: Elastographic mapping and tissue stiffness measurement have potential in lymphoedema assessment for pre-treatment comparisons and a determinant of treatment effect.

[P63] COLLABORATION OF VASCERN'S PEDIATRIC AND PRIMARY LYMPHEDEMA PATIENT REPRESENTATIVES TO ENSURE PATIENT EMPOWERMENT AND TRANSMISSION OF THE PATIENT'S POINT OF VIEW

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Introduction: The VASCERN patient group (European Patient Advocacy Group or ePAG) gathers patient representatives and patient organisations of Rare Multisystemic Vascular Diseases. VASCERN is one of the 24 European Reference networks on rare diseases and the various ePAGs are under EURORDIS guidance and counseling. The Pediatric and Primary Lymphedema ePAG (PPL) currently has five patient advocates, appointed by patient organisations from Denmark, Germany, Italy, The Netherlands, and Portugal. The group has been working closely together since 2019, with the assistance of another 10 patient associations from Europe, called "the ePAG community".

Aim: The VASCERN ePAG enables patient representatives to work together on common issues and deliverables, as well as be involved in VASCERN activities, while representing the wider patient community.

Method: Via monthly meetings in the PPL Working Group, the PPL ePAG co-chair and deputy co-chair represent the patients' point of view in discussions, tasks, and deliverables. The PPL ePAG has monthly meetings, with a pre-planned agenda, discussing the work packages and how to support them, brainstorming new content and ensuring the different patients and nationalities are considered. The ePAG community is involved and consulted via emails and meetings. A closed Facebook group for representatives of the patient organisations is used to disseminate information, share news and for discussions.

Results: Since 2019, five PPL ePAG patient advocates have been working closely together with another 10 patient organisations joining shortly afterwards. The ePAG patient advocates have been involved in the creation of the VASCERN PPL WG's "Patient Pathway" to ensure the patient point of view. The PPL ePAG patient advocates were actively involved in the development of the "Infections and Lymphedema" webinar, including participating as co-hosts, and subsequently disseminating news of the event to the patient population on different social media platforms. There is also continuous involvement in the development and improvement of the "dos and don'ts" factsheets and the "Pills of Knowledge" videos filmed by the patient advocates, which provide relevant recommendations on specific topics, e.g., genetic testing.

Conclusions: Representing the patient community with primary lymphedema, the PPL patient advocates ensure that the needs of the patients are included in the strategic and operational scope of VASCERN. They bring together advocates and organisations from 12 European countries, while disseminating information, best practices, and raising awareness on primary lymphedema. This strong collaboration benefits both the patients with primary lymphedema and their parents/carers and is an asset to VASCERN as a whole.

[P64] PERSISTENT DEEP PRESSURE -A PATIENT WITH LYMPHOEDEMA AND LIPOEDEMA PROVES PATIENCE PAYS

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Introduction: Patient collaboration and enthusiasm are essential for longer-term conservative, literally "patient" treatment for over-hanging lobules around the knee in lipoedema secondary to lymphoedema. Might other treatments such as gastric bypass or local surgery/liposuction have been effective more rapidly? The patient has suffered with "heavy legs" for many years before the two conditions were recognised. She does not want others to suffer due to attitude of "some legs are just like that".

Aim: The objective of this case is to show just how long, and much a patient can suffer before lymphoedema is recognised, and an unusual presentation of coexisting lipoedema is treated satisfactorily by compression alone.

Method: Diagnostic and therapeutic steps describe what was needed for satisfactory symptom control in an otherwise difficult, evolving clinical situation. The case history will be accompanied by high-resolution colour duplex sonography records, to illustrate the steps taken to justify compression to the health insurers, to deal with unanticipated difficulties and to ensure that there was no harm was done. The clinician will describe the reasoning behind the various choices for compression in lipoedema.

The patient has collected photographs and data from diaries to describe her psychosocial history in a short video-clip, with the raised hopes and disappointments which have accompanied her on the journey.

Results: Over a period of about 2 years, there has been a gradual and acceptable decrease in the size of the overhanging lobules of lipoedema below the knees. This was associated with better lymphoedema control. The ultrasound pictures show how useful quantifying the depth of subcutaneous tissue layers of affected areas has been in revealing that the thickness of echo-dense layers (if that is of "increased intercellular fibrosis and adipocyte hypertrophy") in subcutaneous fat. This was more likely to be associated with symptoms and the need for increased pressure of compression garments.

Conclusions: A patient with overhanging knee lobules due to lipoedema does have an alternative to surgery or liposuction if she chooses. She can be assured that gradual compression of lipoedema lobules by persisting with a scientifically quantified combination of inserts and flat-knit hosiery garments can achieve symptomatic relief, and an acceptable cosmetic result without the need for surgery and /or liposuction.

[P65] PATIENT ASSOCIATIONS ACROSS EUROPE UNITE TO CO-SIGN A MANIFESTO

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Introduction: Lymphoedema is estimated to affect 250 million people worldwide³ however there is still low awareness among the public and the health care professionals. Furthermore, patients are struggling to get a timely diagnosis and adequate treatment for this chronic disease. Patient associations across Europe wanted to raise the attention with politicians, policy makers, health care professionals, researchers, and the general public towards the needs of those who live with, or who are at risk of developing, lymphoedema.

Aim: As patient representatives of different patient associations in Europe, we decided to unite to initiate the change by stating our common needs and challenges in a co-signed manifesto, to raise awareness of lymphoedema and attempt to improve the current condition.

Method: We used the World Lymphedema Day, March 6th, as a platform to reach the public, policymakers, clinicians as well as patients and in 2020 we came together to write and co-sign a Manifesto to express our opinions and urgent needs for those living with lymphoedema in Europe. In 2021 other associations joined our initiative and a total of 27 associations across 13 European countries co-signed the Manifesto and translated it into 11 languages. We managed the communication through emails and online meetings. The Manifesto was shared through social media, websites, and email lists of the associations, and when possible, in

³ Schulze, H., Nacke, M., Gutenbrunner, C. *et al.* Worldwide assessment of healthcare personnel dealing with lymphoedema. *Health Econ Rev* 8, 10 (2018).

person. Patients, clinicians, and stakeholders supported our initiative and shared the local language manifesto on their own social media platforms.

Results: The Manifesto and the messages within were shared across the world by patients, clinicians, organizations, and the public. However, we consider that the greatest success was the commencement of a collaboration among the patient associations, united despite national borders, cultural and linguistic differences for the benefit of the patients. Since the last two years we are working on various projects to support the statements in the manifesto.

Conclusions: We strongly believe that our future collaboration will contribute to enhancing the quality of life for lymphoedema patients across Europe and inspire other associations to collaborate in other parts of the world. The road is still long, but each effort is a step forward and help us to raise awareness, inform and shine a light on lymphoedema.

[P66] A SURVEY ASSESSES THE DANISH PATIENT'S PERSPECTIVE AND SATISFACTION OF THE PRESCRIPTION PROCESS FOR COMPRESSION GARMENTS

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Introduction: It has been a request from the Danish patients that the Danish Lymphoedema Association (DALYFO) investigates the process for prescription and measurement of compression garments. In Denmark there are different local purchasing agreements and processes and while the patients have the right to choose their own supplier the patients have expressed problems with the prescription process, measurement, as well as discrepancies across the country. A survey was therefore conducted.

Aim: The main scope was to evaluate the patient's experience and satisfaction of the prescription process and with measurement and fitting, for different types of lymphoedema or lipoedema, and type of compression across the five Danish regions.

Method: A survey was created based on the patient discussions and the experience of members of the DALYFO board who came from different regions and with different type of lymphoedema and/or lipoedema. Additional patients, patient representatives, members of the industry and relevant clinician were consulted. The process started in May 2020 and the survey was launched in October 2020. An appeal to participate was shared several times in online patient groups, via the DALYFO website, in the membership magazine and via emails.

Results: Responses from 523 patients was included of which 79% had secondary lymphoedema, 16% primary lymphoedema, 4% lipoedema and 1% did not know. The responses came from all five regions with 36% (majority) from the Capital Region. Most patients, 86%, only wore made to measure garments. 67.5% had measurements taken by a fitter, 13% by a physiotherapist, 9% were others, 7.1% in the hospital and 3.4% by home care nurses. The satisfaction of the prescription process was measured on a scale of 1-5, where 1 was very unsatisfied and 5 very satisfied. In general patients were satisfied with the process and measurement. However, 32% answered that the length of the process had at one point made them feel their lymphoedema/lipoedema had worsened. Most patients were satisfied with the time it took to get an appointment for measurement and the time it took to receive their garments subsequently. There were 220 free text answers providing more details, many very personal and emotional.

Conclusions: A survey carried out by DALYFO has given additional information of the Danish patient's experience and satisfaction of the prescription process, measurement as well as the type of compression they use. More work is needed to further evaluate the data and the free text answers.

[P67] SUPPORTING FAMILIES WITH CHILDREN WITH PRIMARY LYMPHOEDEMA IN SCANDINAVIA - A COLLABORATION AMONG PATIENT ASSOCIATIONS

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Introduction: Patients with rare diseases, such as primary lymphoedema, face health disparities and are often challenged to find accurate information about their condition^{4 5}. The Scandinavian patient associations, DALYFO, S-F and NLLF, who already collaborate, all wanted to further support this group of patients and their families by creating a dedicated patient-oriented website written in a "plain"⁶ and local language(s).

Aim: To support families with children with lymphoedema in Scandinavia by providing reliable and up to date information in local language and be a point of reference. To provide information to family members to better understand the condition and thus reduce worry about the future of siblings.⁷

To increase awareness with relevant clinicians, the public, the school-, and recreational systems.

Method: The three patient associations jointly applied for a grant of the Nordic Welfare Center. The project will have three phases. Phase1: Identification of working group, creative brief, content creation, build of website, translations. Phase2: Advertisement. Phase3: Consideration for inclusion of additional Nordic languages.

Each patient association will consult with clinical experts when developing materials to ensure medical correct content. Families from each country will be consulted as well as other patient associations, especially those with focus on children, to ensure appropriateness.

Results: A grant of SEK70.000 has been awarded by Nordic Welfare Center to support this project and was found that it was relevant to Art. 5, 7 and 8 of CRPD⁸ and Goal 3.8 of Agenda 2030⁹. A project leader is identified, project group has been set up and project plan written. Project is expected to have reached Phase 2 Q2-2022.

Conclusions: Families with children with lymphoedema deserve to have reliable information in local language to be able to manage and cope better. The patient associations can support them with a dedicated website in local language, written in a supportive and inclusive way.

4 Kole A. and Faurisson F. (2010) *Rare diseases social epidemiology: analysis of inequalities*.

5 Quéré I. and Moffatt C. (2010) *ILF - Care of Children with Lymphoedema*

6 World Health Organization. Regional Office for Europe. (-2013)-. *Health literacy: the solid facts*.

7 I. M. Pit-ten Cate and G. M. P. Loots. (2000) *Experiences of siblings of children with physical disabilities: an empirical investigation*.

8 United Nations. Convention on the Rights of Persons with Disabilities (CRPD)

9 United Nations. 70/1. Transforming our world: the 2030 Agenda for Sustainable Development

[P68] TAKING OFF WITH A PILOT: TESTING THE FEASIBILITY OF LYMPHOEDEMA RELATED KEY PERFORMANCE INDICATORS FOR A HSE LYMPHOEDEMA SERVICE AT UNIVERSITY HOSPITAL COLLEGE LIMERICK (IRELAND)

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Introduction: A pilot study is a small-scale version of a proposed larger study, that is carried out to test and inform the main study (Kim 2010). However, a pilot study may also be carried out to test the feasibility of study tools, research instruments or other, as is the case with this pilot study. According to Polit and Tatano Beck (2004), any pilot study should be intentional and planned, with the aim not necessarily to produce results but to clarify the relevance of instruments, sample size, data collection tools and to discover any barriers to the research (Beebe 2007, Kim 2010).

The quality of health services is important for those who provide them and for those who use them. It is therefore vital that services are monitored for quality and that we measure the care provided to service users. Specific measurement tools called Key Performance Indicators (KPIs), are one such measure that can be utilized by service providers to monitor service quality. Using a Delphi Technique, a Suite of 7 KPIs relevant to lymphoedema services were developed through consensus by lymphoedema experts, service providers and practitioners. The next step was to test the feasibility of this suite of 7 KPIs before they are proposed for acceptance and usage as a monitoring and measurement for all lymphoedema services in Ireland.

Aim: The overall aim of the KPIs is to help improve lymphoedema services nationwide. The Lymphoedema Service at University Hospital Limerick, was chosen as the pilot study site, offering it an opportunity to lead the way in best practice. This pilot study took place over a three-month period. It is hoped that the findings will form a template for other HSE regional lymphoedema services.

Method: The Suite of 7 KPIs was already developed from a previous study (MacSweeney, M, 2019). This study's sole aim was to test the feasibility of implementing those KPIs into practice.

Results: The results show that it is quite feasible to use the KPIs during routine patient consultations with the potential of ensuing improved care. Approx 10 mins will need to be allocated to the consultation time to allow for each of the KPIs to be checked.

Conclusions: While all public hospital settings may not provide dedicated lymphoedema services, this study may help others seeking to implement KPIs into their service.

[P69] VOLUNTEER TELEPHONE SUPPORT SERVICE (VTSS) FOR PEOPLE LIVING WITH LYMPHOEDEMA OR LIPOEDEMA WITHIN AN NHS CLINIC

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Introduction: It is recognised that self management in a long term condition is difficult to sustain. It was identified that the specialist service was limited in encouraging ongoing long term goals and providing the social support needed by some of our patient group due to caseload commitments but it was acknowledged positive input would assist in continued self management. The service was developed to provide ongoing support for patients to maintain or reach their goals using a supported self management approach.

Aim: The aim was to provide a community based approach by utilising volunteers who assisted at the specialist clinic to telephone patients and offer support and encouragement as well as review their progress with goals.

Method: The VTSS was developed with input from both service users and volunteers. All were very positive about this service and its potential impact. This was expediated by the covid pandemic and the reduced clinic contacts available.

The documentation, established in collaboration with patients and volunteers, assists the volunteers with background information, purpose of the call and also a reminder of any "red flags" which need urgent follow up. 15 patients gave feedback on the documentation during its creation and then on the final draft.

At present the phone service runs one day fortnightly. Patients are asked at clinic appointments if they wish to be included in this service. Outcomes of the calls are documented and there is a debrief for the volunteer with a specialist lymphoedema practitioner to highlight any issues or follow up required. The contacted patients decide whether they wish further contact and the timescales are mutually agreed with the volunteer.

The documentation generated is scanned into the electronic notes as a record of the contact.

Results: So far (March – May) 27 patients have been supported by this service. 13 have requested regular contact with the volunteers and 9 appropriate review appointments have been generated.

Evaluation has been by questionnaire to the service users as well as quotes obtained during phone contacts and feedback from the volunteers.

The service has evaluated very positively by both the patients and the volunteers.

Conclusions: The service is providing a support for patients in a manner that allows them to lead and shape the input they require. We plan to develop this service by training more volunteers and encouraging a "buddy" system to review goals particularly around exercise/activity and weight loss.

[P70] KEEP IT SIMPLE-5 CASE STUDIES HIGHLIGHTING THE EFFECTIVENESS OF SELF-DIRECTED HEAD AND NECK EXERCISES FOR HEAD AND NECK LYMPHOEDEMA

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Introduction: There are about 11,900 new head and neck cancer cases in the UK every year, (Cancer Research UK 2014-2016). Head and neck cancer is the 8th most common cancer in the UK, accounting for 3% of all new cancer cases (CRUK 2016)

75% of head and neck cancer patients (Deng2012) experience swelling in the submental and/or in the submandibular area immediately or a few months following completion of their cancer treatment. Treatment can be a combination of surgery, radiotherapy and chemotherapy.

Aim: In this poster, we detail 5 case studies to highlight the effectiveness of self-directed head and neck exercises as initial treatment in new head and neck cancer patients, with mild to moderate lymphoedema.

Method: Our service developed a Head and Neck exercise leaflet and videos to be taught during initial assessment by a Lymphoedema Specialist. We identified 5 case studies who had no neck or shoulder restrictions, nor experienced any pain. They were asked to perform these exercises at least two to three times every day and then reviewed after six to eight weeks. Consent was obtained. Following clinical assessment, head and neck photographs were taken to allow comparison with volume.

Results: Photos revealed reduction of the swelling in the head and neck area. Patients reported that the tissues in their submental and/or submandibular area had become softer and this was confirmed by the lymphoedema specialist examination. All commented that they had more movement in the neck and shoulder region and some noted their swallowing reflex had improved.

Conclusions: Head and neck exercises were found to reduce the swelling and soften the tissues in these 5 case studies showing the importance of movement in lymphoedema management.

Measuring swelling in Head and Neck patients can be quite challenging, photographs are a simple visual aid to demonstrate differences in contours when assessing the patient. They are a good incentive for patients to continue their lymphoedema self-treatment if they can see a reduction of their swelling.

In six to eight weeks, after assessing the impact of exercises, the patient would then be taught further interventions if needed such as self-bandaging techniques, kinesiotape or be reviewed for an intensive course of Manual Lymphatic Drainage.

Our service found that by keeping this pathway simple, patients were engaged from the beginning, in their lymphoedema self-management and they were willing and able to absorb further information imparted to them at each clinical review.

[P71] INTERMITTENT PNEUMATIC COMPRESSION AND THE EFFECT OF DIFFERENT COMPRESSION SEQUENCING FOR TREATING LOWER LIMB LYMPHOEDEMA

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Introduction: Intermittent pneumatic compression (IPC) represents an adjunctive treatment modality to decongestive lymphatic therapy for the treatment of lymphoedema however; a robust evidence base supporting its use in lymphoedema is yet to be established.

Aim: The study aimed to assess the effect of different compression sequencing cycles of the IPC device (LymphAssist, Huntleigh Healthcare, UK) for treating lower limb lymphoedema. The LymphAssist mode has been designed to mimic the manual lymph drainage process while sequential IPC applies compression in an ascending pattern up the limb.

Method: This self-controlled, randomized trial included fifty participants ten of which were lipoedema patients. Eligible patients who consented to take part followed a prescribed treatment regime consisting of a five-week control period, followed by a five-week intervention period during which they used their allocated IPC device daily. Finally, participants underwent a five-week washout period where IPC therapy was discontinued.

Outcomes assessed at each clinic visit included: changes in limb volume and impact on patient rated quality of life scores from the 'Lymphoedema Functioning, Disability and Health Questionnaire'. Ethical approval was granted by REC 6 [REC 18/WA/0114].

Results:

Lymphoedema – A comparison of devices changes in absolute volume following IPC use

	LymphAssist (n=37 legs)	Sequential (n=36 legs)	P
Distal (mls)	-230 ± 135	-140 ± 84	<0.01
Proximal	-124 ± 118	-150 ± 158	0.7
Full (mls)	-357 ± 167	-287 ± 140	0.06

Lipoedema – Changes in absolute volumes throughout the study period

Visit (n=20 legs)	Mean difference in volume (mls)	P
Baselines vs control	+109 ± 336	0.1
Control intervention vs	-90 ± 178	0.4
Intervention washout vs	+150 ± 111	0.02

All participants – A comparison of changes in quality of life scores from control to intervention

	Control (n=50)	Intervention (n=50)	P
Physical change	1 ± 12	-14 ± 17	<0.01
Mental change	-2 ± 14	-7 ± 16	0.2

Household change	-4 ± 13	-3 ± 19	0.7
Mobility change	-3 ± 19	-7 ± 17	0.4
Social change	-4 ± 22	-7 ± 12	0.5
Total change	-2 ± 10	-8 ± 10	0.02

Conclusions: This study addresses an important evidence gap relating to the clinical effectiveness IPC in the treatment of lymphoedema. The LymphAssist cycle was more effecting in reducing distal lymphoedema than sequential IPC. IPC had no effect on lipoedema volume however, patient reported quality of life scores improved in both lymphoedema and lipoedema patients.

[P72] EXPLORING CHALLENGES AND CREATIVITY IN SELF-MANAGING BREAST CANCER-RELATED LYMPHEDEMA AND WORK BY U.S. HISPANIC/LATINA SURVIVORS: A CASE STUDY APPROACH USING PHOTO-ELICITATION

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Introduction: Research has shown that breast cancer-related lymphedema (BCRL), a chronic side effect of cancer treatment, can negatively impact the ability to perform work. BCRL changes work and life activities, necessitating adaptations in cultural, family, leisure, and occupational roles. Hispanic/Latina survivors are at greater risk of developing BCRL and may experience more complications, potentially compromising work ability.

Aim: An ethnographic instrumental photo-elicitation case study was undertaken to explore the impact and changes Hispanic/Latina breast cancer survivors face as they navigate breast cancer-related lymphedema (BCRL) self-management and work issues.

Method: A qualitative study exploring the issue of BCRL self-management and work challenges was conducted. A photo-elicitation interview (PEI) was completed building on the secondary analysis of a Hispanic/Latina multi-case return-to-work (RTW) study exploring the impact of BCRL on RTW quality of life. Qualitative descriptive and In Vivo first- and second-level coding were completed in the secondary data analysis, and Interpretative Engagement analysis was conducted on the PEI to identify impact and change themes.

Results: Secondary analysis of the RTW study illuminated themes of: importance of support relationships; family adaptation; and obstacles that Hispanic/Latina survivors encounter in self-managing BCRL and work activities. Historia's (self-selected abbreviated pseudonym) photographic narrative illuminated daily challenges she encountered as a cancer survivor self-managing and working with BCRL. Historia, with the help of family members, implemented creative adaptations to complete work activities, care for her family, and continue to engage in social activities in her community.

Conclusions: A reciprocal relationship exists between BCRL self-management and work. This reciprocal impact requires the survivor to find creative ways to complete work and self-manage BCRL symptoms for life. Support of family, healthcare professionals, and work colleagues and adjustment of self-management behaviors to maximize work success optimizes quality of life. Optimizing survivorship care involves understanding cultural and personal views of work and social roles to effectively adapt BCRL self-management behaviors. Engaging with personal support networks can facilitate life-long self-management strategies. Survivorship care plans that include discussions on return-to-work issues can be used to document effective behaviors and adaptations over the lifetime of the survivor and guide the healthcare team's support.

[P73] SELF-MANAGEMENT AND COMPRESSION OF GENITAL AND BREAST/THORAX LYMPHEDEMA

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Introduction: Patients live with lymphedema 365 days a year. Because treatment cannot (and should not) last that long, patients must be educated in self-management in order to become as independent from their therapists as possible. This is especially true for patients with genital or breast/thorax lymphedema.

Aim: Therapists who are aware of the “tricky areas” of compression treatment are able to offer their patients individual solutions that are practical and cost effective.

Method: Understanding Starling’s Equilibrium and the Law of Laplace, as well as knowledge of available materials allows therapists to treat existing secondary genital and breast/thorax lymphedema. Patients who are in the post-operative phase of wound healing, directly after and up to six weeks post-surgery, are able to take an active part in preventing or prolonging the onset of lymphedema.

Results: Patients with genital lymphedema are highly motivated to learn self-management techniques once they have experienced how MLD/CDT can improve the quality of their lives. Patients with breast/thorax lymphedema also describe notable relief of discomfort when using special padding, which allows lymph and tissue fluid to flow unhindered under the elastic band of the bra or bustier.

Conclusions: Applying compression bandages to another person’s genitalia or breast is definitely one of the more “unusual” aspects of life as a lymphedema specialist. Because of the prevalence of secondary lymphedema on account of oncological treatments, it is helpful for therapists to encourage patients to learn and practice self-bandaging as one aspect of self-management. Younger or less experienced therapists benefit when they are able to learn simple tips and strategies that they can pass on to their patients, allowing them to be less dependent upon continuous treatments in an outpatient setting.

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[P74] EFFECTIVENESS OF PORTABLE INTERMITTENT PNEUMATIC DEVICES FOR LYMPHEDEMA MANAGEMENT: A PRELIMINARY STUDY

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Introduction: Lymphedema can cause significant psychosocial, functional and financial hardship, thus, may damage the quality of life (QoL) of patients. Traditional methods for lymphedema management, manual lymphatic drainage, requires trained and skilled professionals. Although static compression garments are also being used to aid with lymphedema self-management, difficulty in donning, mobility, aesthetics, comfort, and poor durability effect the efficacy of this treatment modality. Additionally, their effectiveness in managing lymphedema remains debatable. Intermittent pneumatic compression (IPC) therapy is a clinically proven dynamic compression therapy that is safe, efficient, and patient-centred with no significant complications or adverse outcomes. The issue with current IPC devices is limited mobility once the device is being used. wavetec™ has developed an untethered portable IPC device designed to enhance circulation, reduce swelling, reduce muscle soreness and improve the QoL of its user.

Aim: This preliminary study focuses on understanding the impact of the wavetec™ IPC device on the QoL in health consumers by assessing the effectiveness to address the user needs.

Method: A qualitative pilot study was conducted to identify the needs of patients with circulatory conditions and healthcare providers. A total 19 subjects were interviewed for 4 weeks which period they used the wavetec™ IPC device. Feedback was taken to verify the effectiveness of the device to aid in lymphedema and other circulatory condition management. A product research was done to identify the IPC devices available in the market.

Results: Despite the adherence to conventional compression methods the subjects were using, 60% of subjects actively preferred to use wavetec™ IPC device because of portability and convenience. The device had improved independence, increased mobility, and rejuvenated the subjects’ legs. Lymphedema patients (37%) and therapists (11%) suggested the need for foot coverage and different wrap sizes to help improve compliance. Seniors (11 %) preferred a device with bigger buttons to aid with limited dexterity. Lymphedema patients also favoured a visual reduction in swelling and being educated on the device to verify the effectiveness. The idea of mobile app integration was not supported due to non-tech-savvy seniors and possible cost increase. According to the product research, current IPC devices do not consist of all the preferred options in one device.

Conclusions: Wavetec™ IPC device is convenient, portable, and cost-effective. However, more iterations, including foot coverage, are required to fulfil the health consumer’s needs as the current device has not fully been optimized to improve phyco-social and functional requirements of users.

[P75] THE IMPACT OF BREAST CANCER-RELATED LYMPHEDEMA ON RURAL AND SMALL-TOWN SURVIVORS ON WORK AND QUALITY OF LIFE: A MULTIPLE-CASE STUDY

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Introduction: Breast cancer-related lymphedema (BCRL) is a lifelong condition. Millions who develop breast cancer are younger than retirement age and at a lifetime risk for developing BCRL. Rural and small-town survivors in the United States may face unique challenges in terms of access to health care and BCRL/survivorship resources.

Aim: This multiple-case study describes how BCRL influences the work experiences and quality of life (QoL) of survivors living in rural and small towns in Missouri, United States.

Method: A multiple-case study approach was appropriate for use to examine BCRL in rural survivors because the method aims to describe why and how survivors with BCRL return to work following BC treatment. Thirteen survivors from rural and small towns in Missouri completed semi-structured interviews and a standardized QoL instrument. Interview questions addressed: work demographics; BCRL-related change; work-related outcomes; and environmental characteristics. Cases were analyzed using in-vivo and open-coding techniques and constant cross-case comparative methods per multiple-case study and grounded theory methods. Twelve of the 13 participants' data were synthesized into themes to represent an illustrative case (cross-case synthesis). The 13th case is presented as a contradictory (rival) case.

Results: Four themes are represented within the illustrative case – multiple medical encounters; the development of self-care routines; the reciprocity of work/live activities, triggers, and adjustments; and rural/small-town cultural impact. Upon BCRL diagnosis, survivors received intensive treatments, eventually establishing self-care routines. Survivors identified strategies for working around their BCRL when completing work and home responsibilities. The contradictory (rival) case was more recently diagnosed and, as such, had not established self-care and coping mechanisms in the same way.

Conclusions: During this study, we were able to add to what is known about BCRL and work/life experiences and perspectives, specifically those of survivors living in rural and small-towns. Our illustrative case presents a somewhat ideal scenario of a survivor surviving and thriving with this chronic condition. Our rival case challenges that ideal and calls attention to how detrimental a diagnosis of BCRL can be. Survivors alleviate BCRL's symptoms and improve their QoL by establishing self-care strategies. This provides guidance for client-centered survivorship care-planning and occupational rehabilitation of rural survivors with BCRL. This study provides the foundation for developing information for rural survivors that supports mental preparation and coping skills for BCRL self-management.

[P76] A LITERATURE REVIEW OF THE EDUCATION NEEDS OF HEALTH CARE PROFESSIONALS MANAGING CHILDREN AND YOUNG PEOPLE (CYP) WITH LYMPHOEDEMA.

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Introduction: A greater understanding has developed of the diversity of presentation and challenges in management of lymphoedema in children and young people (CYP). What is clear is that accessing expert care can be a long process, involving a variety of health care professionals (HCP). It is unclear what specific preparation is necessary for HCP to advise and treat CYP with lymphoedema, and whether an education need exists.

Aim: The literature search aimed to establish whether an education need in relation to the management of CYP with lymphoedema had been investigated among HCP, and if not, what education need is implicated by previous studies and narratives.

Method: Systematic searches of databases Embase <1996 to 2021 Week 14>, Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <2017 to April 12, 2021>; EBSCO including Child Development and Adolescent Studies; CINAHL; Health Source Nursing/Academic Ed; MEDLINE; and Professional Development Collection were undertaken on 13th April 2021. The search was limited to publications from 2016 to 2021 and in peer reviewed, English language publications only. PhD theses were included. Search terms included lymph(o)edema, education/training, child(ren)/p(a)ediatric/adolescent/youth/teenager. Removal of duplicates, title and abstract review, resulted in 26 publications to consider.

Result: There were no studies which specifically explored the education needs of HCP responsible for treatment of CYP with lymphoedema in terms of clinical knowledge and wider skills to support the family, school teachers and other significant stakeholders. Implied knowledge need can be drawn from qualitative and phenomenological studies with or by young people, their parents and HCP; audits of services; a national protocol and a national charter; and a paediatric investigation tool.

Conclusions: This was a systematic literature review of recent English language literature from which tentative conclusions of education need can be drawn. Further investigation is warranted

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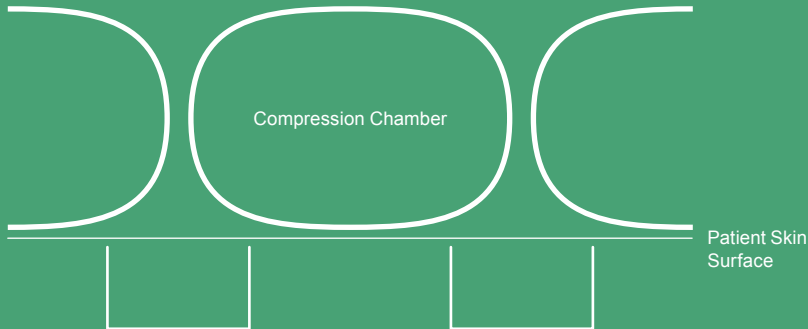


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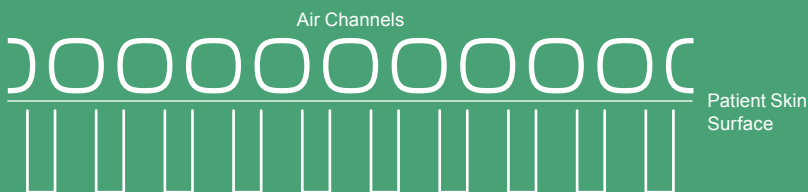
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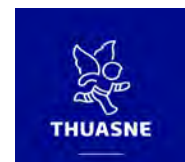
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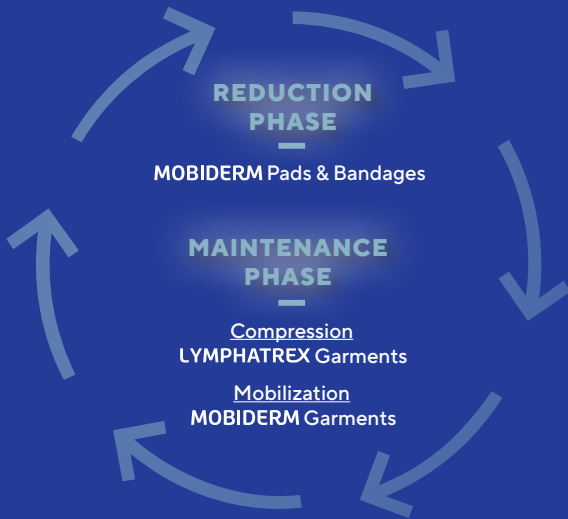
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