7th International Lymphoedema Framework Conference

21-24 June 2017 · Siracusa · Italy

ILF 2017 Programme & Abstracts

Co-hosted by the Italian Lymphoedema Framework

INTERNATIONAL LYMPHOEDEMA FRAMEWORK

ABOUT THE ILF

The International Lymphodema Framework (ILF) was established as a charity in 2009. Its aim is to improve the management of lymphoedema care and related disorders worldwide, by sharing expertise and resources and supporting individual countries to develop a long term strategy for lymphoedema.

For more information about the ILF, please visit: www.lympho.org

INTERNATIONAL LYMPHOEDEMA FRAMEWORK

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Organisation

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Welcome

Dear colleagues and participants,

It is a pleasure to welcome you to the 7th International Conference of the International Lymphoedema Framework (ILF) which is co-hosted by the Italian Lymphoedema Framework (ITALF).

The scientific programme will include keynote lectures, free paper sessions, industry symposia and posters. Thanks to eminent experts and speakers, the programme offers a number of excellent sessions on children's lymphoedema, heart failure and chronic lymphoedema, the LIMPRINT project, plus a specific session with updates from the national frameworks.

We hope you will enjoy the conference and the beautiful city, Siracusa. As a UNESCO world heritage site, the city offers many attractions for different interests, with beautiful historical buildings, a scenic view over the sea and amazing Sicilian food.

Welcome to Siracusa!

Best regards,
On behalf of the ILF and the ITALF Organising and Scientific Committees

Detailed Programme

Wednesday 21 June

	MAIN SESSION ROOM	SESSION ROOM 2
13.30 - 15.15	Joint ILF-ITALF session	
	Chairs: Sandro Michelini & Neil Piller	
	Sandro Michelini: Lymphedema: A therapeutic alliance for a chronic disease	
	Marina Cestari: Chronic oedema in the elderly	
	Maurizio Ricci: The ICF core set for lymphoedema	
	Christine Moffatt: LIMPRINT	
	Vaughan Keeley: ILF outcome project	
	Isabelle Quéré: ILF children's project	
15.30 - 17.00	Patients' session (organised by ITALF)	
17.00 - 22.00	Exhibition build-up	

Thursday, 22 June 2017

	MAIN SESSION ROOM	SESSION ROOM 2
7.30 - 8.30	REGISTRATION	
08.30 - 8.45	Welcome by ITALF and ILF board representatives	
08.45 - 10.15	Plenary session 1: LIMPRINT and related ILF projects	
	Chairs: Stan Rockson & Marina Cestari	
10 min	Intro: Stan Rockson: Introduction to the importance of LIMPRINT	
15 min	Christine Moffatt: Introduction to the concept, design and methods and high level overall results	
20 min	Gregoire Mercier: An overview of the results from the LIMPRINT study	
20 min	Isabelle Quéré: Results from international hospital prevalence studies	
20 min	Vaughan Keeley: Results from international lymphoedema specialist services	
10.15 - 10.30	REFRESHMENT BREAK, EXHIBITION AND POSTERS	
10.30 - 12.20	Free paper session 1	Free paper session 2
	Chairs: Alfredo Leone and Anna Kennedy	*Chairs: Francesco Boccardo and Isabelle Quéré*
10 min	Ad Hendrickx: Compression with the "Juxta Reduction Kit (by medi)" in patients undergoing a total knee arthroplasty	Peter Worsley: Investigating the effects of lymphatic drainage therapies using near-infrared imaging
10 min	Rinaldo Caldirola: Bandaging experience with silicon bandages	Giuseppe Villa: Quantitative evaluation of bicompartimental lymphoscintigraphy in lower limb lymphedema
10 min	Sandro Michelini: Effectiveness of conservative combined treatment in lipedema patients and clinical monitoring	Denise Hardy: How the use of indocyanine green (ICG) fluoroscopy is helping to improve the successful management of lymphoedema
10 min	Neil Piller: The impact of intermittent pneumatic compression therapy on the quality of life of patients with lower limb lymphoedema	Misako Dai: Comparative study between standard ultrasound device and pocket ultrasound device for the evaluation of thickness in subcutaneous tissue for forearm in healthy subjects
10 min	Arun Gogia: Correlating sub bandage pressures with improvement in limb volume and circumference in patients with lower limb lymphoedema	Misako Dai: Pocket ultrasound device versus standard ultrasound device for imaging of subcutaneous tissue in lower lymphoedema patients
10 min	Sandro Michelin: The ultrasound lymph compartments graph and the extracellular matrix pathways	Jean-Paul Belgrado: Deep infrared imaging to identify venous impairment after breast cancer surgery
10 min	Sandro Michelini: Physical treatment in lower limb oedema and cardiac implications: Pro-BNP vs E.F.	Marzanna T Zaleska: Live indocyanine green lymphography shows differences in effectiveness of mld, linforoll massage and intermittent pneumatic compression
10 min	Arun Gogia: Effectiveness of short stretch bandages vs ordinary cotton crepe in lower limb lymphoedema in a tropical setting	
10 min	Daniel Loughnan: Low level laser therapy reduces pain and local tissue water in low back pain - a case series	
10 min	Sandro Michelini: Natural coumarin and routine in lymphoedema treatment	
10 min	Alexandre Pissas: Which is the precise mission of each partner in treating lymphedema?	

	MAIN SESSION ROOM	SESSION ROOM 2
12.20 - 12.50	LUNCH BREAK, EXHIBITION AND POSTERS	
12:50 - 13:50	New solutions in compression therapy Company symposium sponsored by BSN Christine Moffatt CBE FRCN PhD MA RGN DN Prof. of Clinical Nursing and Research, The University of Nottingham "Self-managed oedema reduction and control in changing health care systems" Justine Whitaker MSc RN Nurse Consultant and Senior Lecturer (Uclan), Northern Lymphology Ltd, UK "Night-time compression in long term management of lymphoedema"	
13:50 - 15:20	Plenary session 2: National framework session	
	Chairs: Isabelle Quéré & Maurizio Ricci	
15 min	Sandro Michelini: Italian guidelines on lymphedema: New public regulations 2017	
15 min	Junko Sugama: Development of chronic oedema prevelence in Japan - Moving to national recording of data	
15 min	Susan Nørregaard: National guidelines	
15 min	Anna Kennedy: Canadian framework initiatives	
10 min	Isabelle Quéré: The out-of-pocket payment for lymphedema treatments in France	
5 min	Margaret Sneddon: The lymphoedema education benchmark standards (LEBS) project	
15.20 - 15.50	REFRESHMENT BREAK, EXHIBITION AND POSTERS	
15.50 - 17.50	Free paper session 3	3M company workshop Best Practice in Lymphoedema Bandaging Chair and speaker: Denise Hardy Content overview: Hands-on workshop with time for tips, trouble shooting and Q&A on bandaging.
	Chairs: Corradino Campisi and Neil Piller	
10 min	Corradino Campisi: Lymphatic microsurgery for an early and effective treatment of peripheral lymphedema	
10 min	Francesco Boccardo: Lympha technique for primary and early secondary prevention of lymphedema following cancer treatment	
10 min	Melanie Thomas: Perceptions and attitudes of people undergoing lymphatic venous anastomosis	
10 min	Melanie Thomas: Lympho-venous anastomosis (LVA) surgery in NHS Wales - A service evaluation	
10 min	Harry Voesten: Surgical treatment of advanced lipedema	
10 min	Corrado Cesare Campisi: New surgical options for the treatment of advanced stages of peripheral lymphedema	
10 min	Neil Piller: Do hydrocephalus shunts have a role in the surgical treatment and prevention of lymphoedema?	
10 min	Sara Dessalvi: How to prevent lymphatic injuries in venous surgery	
10 min	Harry Voesten: Long term results of circumferential suction-assisted lipectomy in the treatment of primary and secondary end-stage lymphoedema of the leg in 88 consecutive patients	
10 min	Liesbeth Vandermeeren: Lipofilling of the axilla to reduce secondary lymphedema after axillary lymph node dissection	
10 min	Giuseppe Visconti: Supermicrosurgical lymphatico-venular anastomosis and lymph node free flap transfer for the treatment of peripheral lymphedema	
10 min	Marzia Salgarello: Autologous breast reconstruction and lymph node flap using abdominal perforator flaps: Single-stage total breast and upper limb lymphedema restoration	
18.00 - 20.00	WELCOME RECEPTION AT TEATRO MASSIMO COMUNALE	

Friday, 23 June 2017

	MAIN SESSION ROOM	SESSION ROOM 2
07.45 - 08.15	REGISTRATION	
08.15 - 09.55	**Plenary session 3: LIMPRINT and related ILF projects**	
	Chairs: Marina Cestari and Margaret Sneddon	
15 min	Christine Moffatt: CO in community nursing populations	
15 min	Pinar Borman: A national study of CO in Turkey	
15 min	Peter Franks: Evaluation of outcomes in the management of lymphoedema: The four countries study	
15 min	Stuart Nairn: A sociological perspective on chronic oedema	
15 min	Susie Murray: The challenges of running the LIMPRINT study	
09.55 - 10.25	REFRESHMENT BREAK, EXHIBITION AND POSTERS	
10.25 - 11.55	**Free paper session 4**	**Free paper session 5**
	Chairs: Fausto Passariello and Robert Damstra	*Chairs: Marco Cardone and Pinar Borman*
10 min	Jean-Paul Belgrado: Early detection of secondary lymphedema after cancer treatments	Kenley Schmidt: Reversal of stage 3 lymphedema with weight loss: A case report
10 min	Waldemar L Olszewski: Indocyanine green lymphography is helpful in detection of early lymphedema after breast and uterine surgery before it is clinically diagnosed	Concetta Romano: The effect of combined therapy (multilayer bandage, radiofrequency and FREMS) in post-mastectomy lymphedema and radiation therapy
10 min	Matteo Bertelli: Indication to genetic testing for patients affected by primary lymphedema	Michel Eid: Manual lymph drainage (MLD) and compression in a wound care treatment plan with patient living with lymphedema - Case studies
10 min	Sandro Michelini: Characterization of FOXC2 variations identified in patients with lymphedema-distichiasis syndrome	Renate Roeterink-ten Have: The importance of an interdisciplinary approach of patients with lipedema
10 min	Elizabeth Coveney: The development of a new paediatric lymphoedema service for Wales	Pinar Borman: Lymphedema associated with everolimus in a renal transplant recipient: The efficacy of complete decongestive therapy
10 min	Denise Hardy: 'Lymphaletics': Overcoming barriers for children with lymphoedema	Natalie Lee: Identifying the lymphatic pathways and presentation of the PIEZO1 mutation using NIRF imaging
10 min	Alberto Macciò: Chronic lymphatic skin ulcers and acute lymphangitis	Waldemar L Olszewski: Postmastectomy lymphedema is successfully treated by silicone tube implantation bypassing the axillary pit
10 min	Christian Ptaszynski-Holgar: Keloid/Hypertrophic scarring: Do they impact on the lymphatic system and lymphoedema risk?	Waldemar L Olszewski: Obstructive lymphedema of lower limbs can be successfully controlled by silicone tube implants replacing obliterated lymphatics-six-years follow-up

	MAIN SESSION ROOM	SESSION ROOM 2
11.55 - 12.45	LUNCH BREAK, EXHIBITION AND POSTERS	
12.45 - 13.45	**An innovative approach to the lymphoedema treatment- both for patient and therapist** Company symposium sponsored by Cizeta Medicali Ft.dott. Meadbh Mc Sweeney (Irland) Ft.dott. Rinaldo Caldirola (Italy) Ft.dott. Gianni Moneta (Italy)	
13.45 - 15.15	**Plenary session 4: Children's lymphoedema: ILF project and others**	
	Chairs: Vaughan Keeley & Sandro Michelini	
15 min	Christine Moffatt: Research to understand the use of a children's camp in lymphoedema management and the psychosocial dimensions of quality of life and self management	
15 min	Sandro Michelini: Hereditary lymphoedema and diagnostic aproach	
15 min	Robert Damstra: European VASCERN Network	
15 min	Isabelle Quéré: Assessment of children specific needs: Implication for treatment	
15.15 - 15.45	REFRESHMENT BREAK, EXHIBITION AND POSTERS	
15.45 - 17.30	**Free paper session 6**	**Workshop**
	Chairs: Maurizio Ricci and Anna Kennedy	**Irene Zonderland: The concept of positive health**
10 min	Beverley de Valois: The monkey on your shoulder: A qualitative study of lymphoedema patients' attitudes to and experiences of acupuncture and moxibustion	Workshop by Irene Zonderland & Ad Hendrickx: Experience positive health 60 min workshop
10 min	Shashi Gogia: Community based lymphoedema care in a filaria endemic area - The Sitapur model	
10 min	Robert Damstra: First dutch guideline on lipedema using the international classification of functioning, disability and health (ICF)	
10 min	Elizabeth Conveney: A project partnership between healthcare workers in Sierra Leone & Wales to improve outcomes for breast cancer patients	
10 min	Jean-Paul Belgrado: The occlusion pressure of the superficial lymphatic network in the lower limb of patients with functionnal lymph collectors	
10 min	Peter Viehoff: Identification of international classification of functioning, disability and health categories in lymphoedema patients in South Australia	
10 min	Anna Towers: Chronic lower limb oedema in long-term care populations: Prevention and treatment challenges	
10 min	Peter Viehoff: ICF core sets: A new way of status-reporting for the lymphedema patient	
10 min	Robert Damstra: New European reference network for pediatric and primary lymphedema	
20.00	CONFERENCE DINNER AT DES ETRANGERS HOTEL	

Detailed Programme

Saturday, 24 June 2017

	MAIN SESSION ROOM	SESSION ROOM 2
08.00 - 08.30	REGISTRATION	
08.30 - 10.00	**Plenary session 5: Current thinking in chronic oedema and Lipoedema**	
	Chairs: Alfredo Leone and Vaughan Keeley	
25 min	Stan Rockson: Pathogenesis of edema: The role of the lymphatics	
25 min	Marina Cestari: Protocol of lymphoedema prevention after breast cancer	
25 min	Ethel Foldi: Disturbances of microcirculation in Lipoedema	
10.00 - 10.30	REFRESHMENT BREAK, EXHIBITION AND POSTERS	
10.30 - 12.00	**Free paper session 7**	
	Chairs: Antonio Mander and Neil Piller	
10 min	Karen Morgan: On the ground education programme and the development of the "chronic oedema wet leg pathway"	
10 min	Monica Conway: Professional education on breast-cancer-related lymphoedema and its relation to patient well-being	
10 min	Melanie Thomas: The Impact of lymphoedema risk reducing recommendations on people treated for breast cancer	
10 min	Katie Riches: The assessment of breast cancer related breast and chest wall lymphoedema	
10 min	Ayşegül Yaman: Comparison of the efficacy of different bandaging methods in patients with breast cancer related lymphedema: Preliminary report	
10 min	Merve Denizli: Clinical awareness and knowledge of breast cancer related lymphedema among a group family physicians in Turkey - An online survey (preliminary data)	
10 min	Melanie Thomas: Investigating knowledge and views of lymphoedema healthcare professionals in reducing the risk of lymphoedema in people treated for breast cancer	
10 min	Marco Cardone: Proprioception sense in lymphedema affected upper limb	

	MAIN SESSION ROOM	SESSION ROOM 2
12.00 - 13.00	LUNCH BREAK, EXHIBITION AND POSTERS	
13.00 - 14.00	Driving innovation in chronic edema Company symposium sponsored by Thuasne Speakers & contents: Professor C. Moffatt, University of Nottingham, United Kingdom "Vision and partnership working with the ILF." Professor I. Quéré, University of Montpellier, France "Role of auto-adjustable night-garment in maintenance phase of lymphedema" Dr T.A Baroncelli, CERION, Florence, Italy "Night treatment in chronic lymphedema: Italian cohort experience"	
14.00 - 14.15	LUNCH BREAK, EXHIBITION AND POSTERS	
14.15 - 15.45	Plenary session 6: New ways of thinking	
	Chairs: Sandro Michelini and Christine Moffatt	
25 min	Hiromi Sanada: The role of oedema and pressure ulceration	
25 min	Aimee Aubeeluck: Challenges of understanding self management in chronic oedema	
25 min	Neil Piller: The leading edge - Are we really leading or re-discovering what was done in the past?	
15.45 - 16.00	LIMPRINT POSTER AWARDS	
16.00 - 16.15	CLOSING OF THE CONFERENCE WITH ANNOUNCEMENT OF THE NEXT CONFERENCE	

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NO.	TITLE	PRESENTING AUTHOR
P1	COMPRESSION CORSETS IN PHYSIOTHERAPEUTIC TREATMENT OF PATIENTS AFTER AXILLARY DISSECTION	Rita Hansdorfer-Korzon
P2	MANAGEMENT OF VENOUS EDEMA AND LYMPHEDEMA BY GENERAL PRACTITIONERS	Ivana Dunic
P3	EFFECTS OF COMPLEX DECONGESTIVE THERAPY ON QUALITY OF LIFE, DEPRESSION, NEUROPATHIC PAIN AND FATIGUE IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA	Sibel Eyigor
P4	IS THERE ANY SUPERIORITY? COMPARISON OF FOUR DIFFERENT THERAPY PROTOCOLS ON EXTREMITY VOLUME IN BREAST CANCER RELATED LYMPHEDEMA	Sibel Eyigor
P5	BRAIN HYPER-LYMPHATIC HIGHWAY NETWORK	Francesco Boccardo
P6	COMBINED CIRCUMFERENCE METHOD WITH DIELECTRIC MEASURE IN LYMPHEDEMA DIAGNOSIS: AN OBSERVATIONAL PILOT STUDY	Manfredi Garavaglia
P7	A COMPARATIVE PILOT STUDY TO DETERMINE THE LEVELS AND STATIC STIFFNESS INDEX ACHIEVED IN FOUR VELCRO WRAPPING COMPRESSION DEVICES	Natalie Lee
P8	LYMPHATIC FILARIASIS: A REVIEW OF THE NEGLECTED TROPICAL DISEASE CAUSING SEVERE LYMPHOEDEMA	Neil Piller
P9	DERMATOPATHIC LYMPHADENOPATY: ALERT AXILLARY MASS IN WOMAN WITH HISTORY OF BREAST CANCER	Bruno Amato
P10	TEMPORAL CHANGES IN INTERFACE PRESSURE OF MULTILAYER BANDAGES ON THE UPPER EXTREMITY	Ayana Mawaki
P11	A MULTIDIMENSIONAL INTERVENTION OF EARLY COMPRESSION THERAPY AND EXERCISE IN WOMEN TREATED WITH GYNECOLOGICAL CANCER AT RISK OF DEVELOPING LYMPHEDEMA: A PILOT RCT PROTOCOL	Anna Towers
P12	TREATMENT OF THERMAL ENVIRONMENT IN LYMPHOEDEMA	Guido de Filippo
P13	SUPERMICROSURGICAL LYMPHATIC-VENULAR ANASTOMOSIS FOR LIMBS LYMPHEDEMA: THE CORRECT COMBINATION OF PREOPERATIVE PLANNING WITH INTRAOPERATIVE CHOICES	S. Gentileschi
P14	BACTERIA ARE PRESENT IN SUBCUTANEOUS TISSUE IN OB-STRUCTIVE LYMPHEDEMA– LONG-TERM PENICILLIN PREVENTS THEIR PROLIFERATION AND SUBSEQUENT HOST RESPONSE	Waldemar L Olszewski
P15	LEG EDEMA IN LYMPHATIC INSUFFICIENCY IS LYMPHO-FIBRO-ADIPO-EDEMA	Waldemar L Olszewski
P16	TONOMETRY OF DEEP TISSUES FOR SETTING EFFECTIVE COMPRESSION PRESSURES IN EDEMATOUS LIMBS	Waldemar L Olszewski
P17	PREVALENCE AND CHARACTERISTICS OF LYMPHEDEMA	David H. Keast
P 18	CIRCUMFERENTIAL AND VOLUME MEASUREMENT IN LYMPHEDEMA MANAGEMENT: CAN WE COMBINE ACCURACY, REPRODUCIBILITY, PRACTICALITY AND AFFORDABILITY IN THE SAME DEVICE?	Joseph N. Harfouche

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*Justine Whitaker British Journal of Community Nursing 2016

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- **Justine Whitaker**
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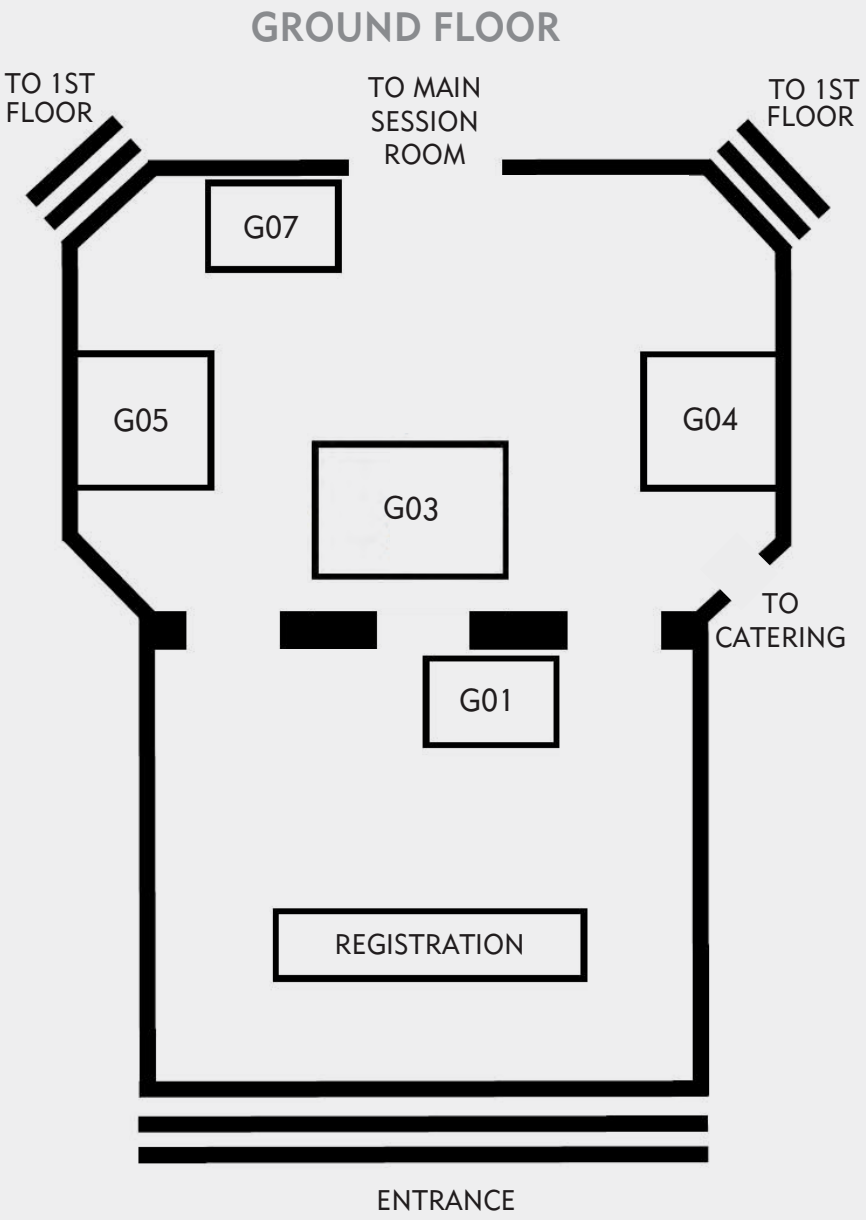
LimbO Waterproof protectors	F 10	Exhibitor	LimbO lets patients shower or bath & keep dressings casts or PICC lines 100% dry. Easy to use & comfortable. UK made; distributed worldwide. BodyBlock – versatile, lightweight limb positioning device.	www.limboproducts.co.uk
AMNOL Think Healthy	F 03	Exhibitor	AMNOL Chimica Biologica was born in Novara 1978, it has been present on the pharmaceutical market with an approach of continuous innovation. AMNOL concentrates its activities in the commercialization and marketing of its products coming from biological extracts and dermocosmetics. It is one of the few company to carry out careful monitoring directly in its laboratories using NIR (near infrared spectroscopy), checks on finished product by HPLC, gluten free products, ISO 9001:2015 certification, over 30 years on intensive research and strong on the market on Phlebology, Lymphology and Diabetic foot lines.	www.amnol.net
XPANDASOX A LITTLE BIT OF fashion WITH A LOT OF FUNCTION	F 07	Exhibitor	Xpandasox is a passion driven company that gives patients a fashionable alternative to cover and hold bandages and wraps in place.Inspired by fashion trends Xpandasox offers both functionality and style to enhance a patients self esteem and confidence.	www.xpandasox.com
Lipoedema UK	F 01	Exhibitor	Lipoedema UK are a charity committed to raising awareness of lipoedema in all fields of medicine so that patients receive an early diagnosis and access to suitable treatments to control this distressing condition. We work closely with our Patrons Professor Peter Mortimer and Dr Kristiana Gordon of St George's Hospital, Tooting and many leading lymphoedema specialists. In 2014, in partnership with the Royal College of General Practitioners Lipoedema UK developed the first elearning course for lipoedema. In 2017 we were part of Wounds UK, Expert Working Group publishing the UK Best Practice Guidelines for LIpoedema.	www.lipoedema.co.uk

Floor Plan



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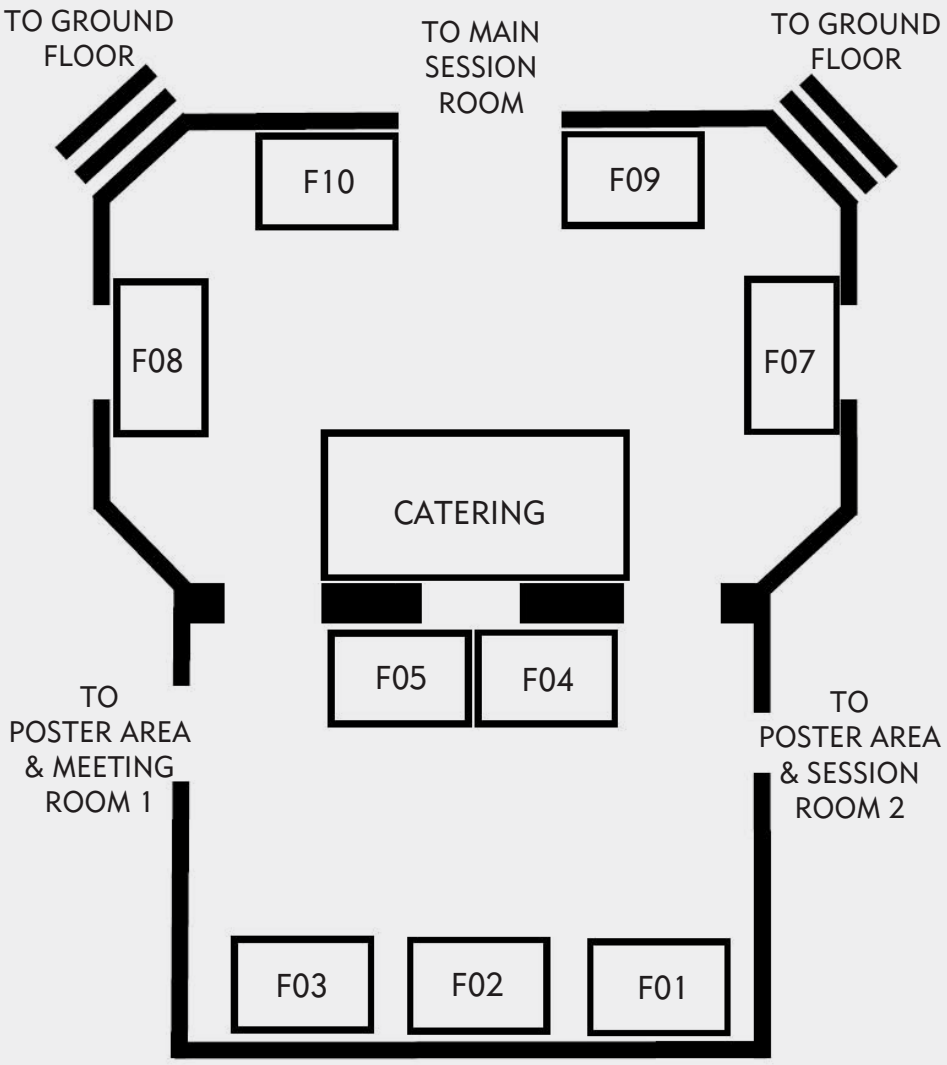

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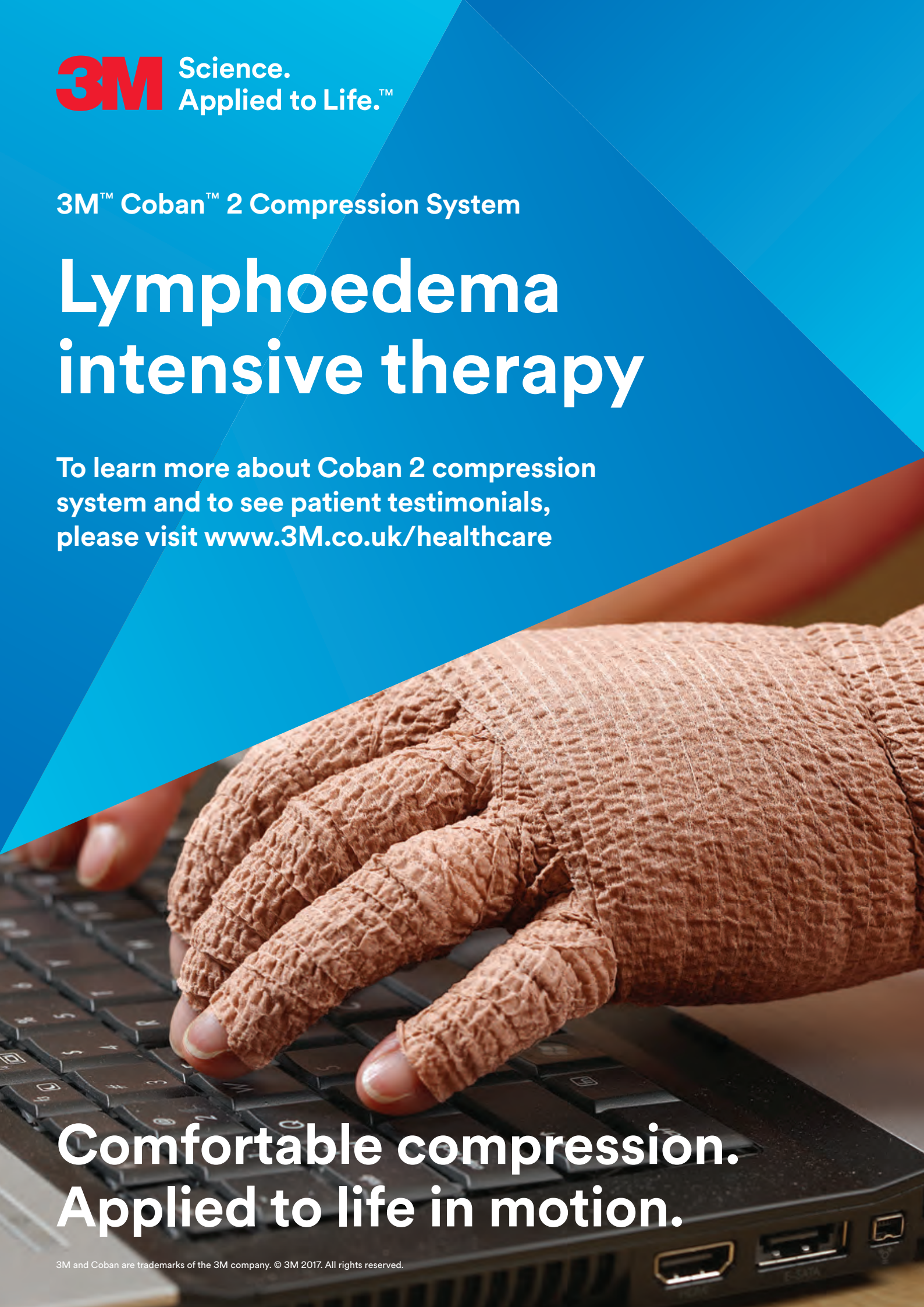

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VENUE
Teatro Massimo Comunale
Via del Teatro · Siracusa, Sicily · Italy

CONFERENCE HOURS
21 June

ILF - ITALF Joint Session	13.30 - 15.15
Patients' Session	15.30 - 17.00

22 June

Registration	07.30 - 08.30
Scientific programme	08.30 - 17.50
Welcome reception	18.00 - 20.00

23 June

Registration	07.45 - 08.15
Scientific programme	08.15 - 17.30
Conference dinner	20.00

24 June

Registration	08.00 - 08.30
Scientific programme	08.30 - 16.00

INTERNET
Free WI-FI is available in the conference area.

ENTITLEMENTS
Registration for the conference includes admission to the full conference programme, coffee breaks and lunch, welcome reception, conference bag and programme & abstract book.

CERTIFICATE OF ATTENDANCE
All participants can collect their certificate of attendance at the registration desk on the last day of the conference.

TRANSPORTATION
There is a direct bus between Catania airport and Siracusa, which takes approximately one hour. Shuttle transfers can also be booked from the airport to the venue. You can book transfers via this website: www.cataniaairporttransfer.com

PARKING
It is not possible to park in Ortigia (the old town in Siracusa) as it is a limited traffic zone.
You can park in one of the parking lots nearby. The parking house called Foro Vittorio Emanuele II is the one that is closest to the venue (approximately a 15 minute walk). The parking costs are €0.60 per hour in most spots.

INFORMATION FOR SPEAKERS
Please bring your presentation on a USB stick and make sure to upload your presentation before the session starts. Your presentation should be uploaded to the computer in the session room. An assistant will be present to assist you in uploading your presentation, if needed.
Please note that we do not allow use of personal laptops for presentations.

INFORMATION FOR POSTER PRESENTERS
Posters can be mounted on Thursday 22 June at 8.00 am.
The conference secretariat will provide all necessary equipment to mount the posters.
Posters can be removed after the last session on Saturday 24 June at 16.15.

THINGS TO DO
Siracusa offers lots of culture, history and beautiful nature with ancient Greek ruins, baroque piazzas and sparkling blue sea. The city is divided into two different sections: the urban part of the city and Ortigia, the island of the city. Here you can enjoy architectural buildings from different historical periods and some of the most beautiful beaches in Sicily.

SOCIAL EVENTS
Welcome reception 22 June at 18.00
The welcome reception will be held at the conference venue, Teatro Massimo Comunale.
This will be a nice opportunity to meet old and new colleagues, while enjoying drinks and finger food. The welcome reception is included in the registration fee.

Conference dinner 23 June 2017 at 20.00
The conference dinner will be held on 23 June 2017 at 20:00 at the Des Etrangers Hotel which is located within 5-minute walk from the conference venue. Delicious Italian food and drinks will be served.
Address:
Passeggio Adorno, 10/12, 96100 Siracusa

The price for the dinner is € 55. Tickets for the dinner can be booked onsite at the registration desk.

THUASNE

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Réf. 1706248 (06/2017)

Oral Abstracts

[1] COMPRESSION WITH THE "JUXTA REDUCTION KIT (BY MEDI)" IN PATIENTS UNDERGOING A TOTAL KNEE ARTHROPLASTY

Ad Hendrickx[1], Wim P Krijnen[2] , Robert Damstra[3] , Richard Bimmel[4] , Cees van der Schans[5]

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Total knee replacement is a successful operation in the treatment of osteoarthritis.
Patients undergoing a knee arthroplasty can experience pain, swelling, a decrease in knee-extension strength, loss of range of motion, causing a decline in functional performance (Holm, B 2010). Compression therapy is a frequently used modality in the postoperative treatment to reduce swelling. The literature is not consistent about the effects of compression therapy (T.M. Brock 2015). Our experiences with compression, combined with self-management in the treatment lymphedema create possibilities for transition of this treatment modality to orthopedic surgery.
With regard to the type of bandage, inelastic compression bandages have been found to have a low, tolerable resting pressure and a more effective activation of the deep venous system and calf muscle pump with ambulation compared to elastic materials.
The Juxta Reduction Kit (by medi ®) is a non-elastic compression device, suitable for self-management. The device allows full ROM, so ambulation and exercise will not be impaired.
It is hypothesized that immediate postoperative compression and prolonging the period of use until 6 weeks postoperatively will prevent excessive swelling and initiate an earlier reduction. Reduced swelling improves range of motion, knee extension strength, reduces pain, supporting the rehabilitation process.

This pilot study demonstrates a feasible concept. Regarding outcome on volume the preliminary results show a positive effect in favor of the treatment group, supporting the need for further research.

[2] BANDAGING EXPERIENCE WITH SILICON BANDAGES

Caldirola R.[1], Cestari M. [1], Conti E. [1], Famoso L. [1], Bordoni M. [1]

[1]*A. Manzoni Hospital- Lecco Presidio di Merate Pianeta Linfedema Study Centre - Terni*

Introduction The bandage is the main element in the ambit of lymphoedema and phlebo- lymphoedema treatment.
An optimal bandage must have high pressure peak values during movement, high stiffness values, high comfort values and has to ensure a volumetrical and tonometrical oedema decrease.

Description The authors have studied the Cizeta Press® short stretch silicon bandages to test the action, the responsiveness to the requirements of a lymphological bandaging and eventual advantages compared to the short stretch.
The silicon bandages have an extensibility of 35% with dots on one side, coloured stripes at 25-50-75% of their own height and have different heights 5-8-10 cm.

Implications In this study carried out on 53 patients affected with limbs lymphoedema (upper limb: 13 secondary - lower limb: 13 primary - 19 secondary) and phlebo- lymphoedema (lower limb: 8) the utilization of these bandages are presented.

Conclusions This study has highlighted an optimal pressure peak values during movement, stiffness values on average above 10, low bandages displacement (2-3 cm in 15% of patients), highest comfort values (VAS average value equal to 2.4), volumetric and tissutal consistency decrease in all patients (after 24 hours of bandaging and at the end of 10 treatment sittings) and, furthermore, optimal hysteresis values after continuous use as well as after washing and ironing (values between 0.96 and 1.019).

[3] EFFECTIVENESS OF CONSERVATIVE COMBINED TREATMENT IN LIPEDEMA PATIENTS AND CLINICAL MONITORING

Sandro Michelini[1], Marco Cardone[1] , Francesco Cappellino[1] , Alessandro Fiorentino[1] , Francesca Perrone[1], Zingaretti Crtistina[2], Saverio Cinti[2]

[1]*Ospedale San Giovanni Battista, Rome, Italy*
[2]*Università Politecnica delle Marche, Ancona, Italy*

Introduction Lipedema is painful and causes an impairment of daily activities. Traditional conservative treatments combine compression therapy, lymphatic manual drainage, and diet modification, mainly addressed to reduction of pain.

Aims of study Aim of the study was to evaluate effectiveness in adding to these treatments low frequency ultrasound therapy, through 40 KHz cavitation, extracorporeal schok wave therapy (2 atm., 300 blows/min, 4.000 blows/ session), manual lymphatic drainage and anelastic bandaging, in reducing leg measurements after treatment.

Methods The study was conducted on 30 affected patients, in II clinical stage. The subjects underwent 10 sessions of treatment addressed to the fatty tissue of the legs, twice a week. Leg measurements, VAS pain scale and ultrasound measurements of suprafascial thickness were performed before and after treatment protocol.

Results The results showed a significant reduction of leg measurements and of suprafascial thickness (14%), showing better results in combining all the performed conservative treatments, compared to limited protocols observed in literature. Average values of VAS pain scale showed significant reduction after treatment (average 3.7 points). Lymphoscintigraphy performed in 16 cases demonstrated a decrease of dermal back flow (with normal picking up of tracer at root of limbs in all cases) at the end of treatment. BMI was substantially unchanged before and after the treatment in all patients. We also started electronic microscopy examination of histological samples in familial cases in order to evaluate common morphological and functional features in inherited lipedema.

[4] THE IMPACT OF INTERMITTENT PNEUMATIC COMPRESSION THERAPY ON THE QUALITY OF LIFE OF PATIENTS WITH LOWER LIMB LYMPHOEDEMA

Malou van Zanten[1], Lukah Dykes[2], Neil Piller[2]

[1]*Lymphoedema Clinical Research Unit, Department of Surgery, Flinders University South Australia, Adelaide, Australia*
[2]*Flinders University South Australia, Department of Surgery, Lymphoedema Clinical Research Unit, Adelaide, Australia*

Introduction: Lymphoedema is a chronic progressive condition of the accumulation of protein rich fluid in the tissues. It can affect extremities of the body and be apparent at birth (primary) or acquired due to external factor such as trauma or treatment for cancer (secondary). Lymphoedema responds best to a combination of so called conservative treatment consisting of compression therapy, massage, exercise, skin care, and self-management. Multi-chamber intermittent pneumatic compression (IPC) device is proven to be useful therapy in treatment of lymphoedema in the home environment, and fits in the patient's self-management regime.

Aims: The clinical study was set up to evaluate the IPC device for a 12-week treatment in the home environment. The objective was to assess the impact on quality of life, satisfaction/tolerance of device and pain level using IPC.

Methods: Participants were recruited from a lymphoedema patient database through the Lymphoedema Clinical Research Unit. Physical measurements were recorded and a lymphoedema quality of life questionnaire was completed at baseline and post-treatment. Data were analysed using a maximum likelihood classification model.

Results: A total of 41 participants were included in the study (15 males / 26 females), with a mean age of 57. Higher body weight, body fat percentage, perometry volume and bioelectrical impedance value were predictive of less favourable responses. A positive treatment effect was determined for patient responses to questions concerning occupation, appearance, self-feeling, and overall quality of life score.

Conclusion: IPC is a useful, additional treatment tool for lymphoedema that improves patient quality of life.

[5] CORRELATING SUB BANDAGE PRESSURES WITH IMPROVEMENT IN LIMB VOLUME AND CIRCUMFERENCE IN PATIENTS WITH LOWER LIMN LYMPHOEDEMA

Arun Gogia[1], Anita Dhar Bhan[2]

[1]All India Institute of Medical Sciences, Lymphatic Education and Research Network, Sanwari Bai Surgical Centre, New Delhi, India
[2]All India Institute of Medical Sciences, New, India

Objectives: Correlate limb reduction secondary to MLLB with sub bandage pressures and SSI

Materials & Methods: Patients with lower limb lymphedema were randomized into two groups and provided Cotton crepe or Short stretch bandages for treatment. First application of bandage was done by trained staff with measurement of pressures 10 cm above the ankle using the PicoPress® (Ms Microlabs Inc). A minimum of 40 Hg resting pressure was ensured. For monitoring the patient was asked to stand and also exercise. Patient was asked to return two days later and pressure taken again before removal and reapplication of bandage. Volume and circumference measurements were done on day 0, 2 as well as a week and month later. Patients were also questioned about pain in walking, slippage of bandage and overall comfort.

Results: Short stretch bandages generated significantly higher pressures. Pressures fell by day three, due to slippage but volume improvements were noted. Average fall of circumference of the leg as well as volume was best with pressures between 60-80 mm Hg.

30 patients in each arm	Day 0			Revisit on 3rd day		
Average Pressures in mmHg	Resting	Highest pressure	SSI	Resting	On erect position	SSI
Short Stretch	63.33	80.67	19.9	25.13	29.3	7.47
Crepe	46.03	56.07	16.67	18.31	19.93	6.86
Significance (T Test)	0.00011	0.00008	0.24770	*0.0139*	*0.0100*	0.83778

Conclusion: There is little correlation of SSI to type of bandage. Overall reduction is better with higher pressures.

[6] THE ULTRASOUND LYMPH COMPARTMENTS GRAPH AND THE EXTRACELLULAR MATRIX PATHWAYS

Fausto Passariello[1], Sandro Michelini[2]

[1]*Fondazione Vasculab ONLUS, Italy*
[2]*Ospedale San Giovanni Battista, Rome, Italy*

In lymph diseases the extracellular matrix (ECM) modifications are placed mainly between the superficial and the deep fascia and rarely in a duplication of the superficial fascia. The ECM extends to all the limb length, subdivided into compartments, which are outlined by the fascia septa. The subdivision is not complete and subsequent compartments can communicate through barrier interruptions, which are already present in normality.

It is possible to imagine a continuous duct, oriented along a different direction in each section, often along the longitudinal axis of the compartment, changing in the point of transition from one compartment into another.

A fruitful research line lies then in the ultrasound quantification of matrix granularity, in the computation of its porosity coefficient and in the detection of the individual fascia discontinuities, in order to trace the ideal boundaries of the inter-compartment pathways. When the compartment communications are many a branching network can be drawn, which has been named the ultrasound lymph compartment graph (ULCG).

The current research describes the adopted procedure and the necessary computations to build the graphic representation.

[7] PHYSICAL TREATMENT IN LOWER LIMB OEDEMA AND CARDIAC IMPLICATIONS: PRO-BNP VS E.F.

Sandro Michelini[1], Marco Cardone[1], Alessandro Fiorentino[1] , Francesco Cappellino[1] , Serena Michelini[1]

[1]*Ospedale San Giovanni Battista, Rome, Italy*

Introduction:
Edema of the lower limbs is frequently found in heart failure, especially in elderly subjects as bilateral and symmetrical oedema of the lower limbs. 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; actually the real indicative factor of the cardiac compliance is the Pro- Brain natriuretic peptid), the value of which is indicative both from the functional point of view of the heart and for the directions of physical treatment.

Materials and Methods:
EF and PRO-BNP was tested in a group of 110 patients with bilateral edema of the lower limbs, of mixed genesis (65 females and 45 males, aged between 13 and 79 years, mean age 67 years).

Results:
We found abnormalities in EF values in 15.5% of subjects. The PRO-BNP values, on the contrary, appeared altered in 86.1% 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% (25-115%) to return to normal values at the end of treatment in 79% of subjects with baseline alterations.

Conclusions:
PRO-BNP is an important value in diagnostic and in monitoring the physical treatment in patients with bilateral lower extremity edema due to central and peripheral vascular problems.

[8] EFFECTIVENESS OF SHORT STRETCH BANDAGES VS ORDINARY COTTON CREPE IN LOWER LIMB LYMPHOEDEMA IN A TROPICAL SETTING

Anita Dhar Bhan[1], Arun Gogia[2], Anurag Srivastava[1] , M C Misra[1]

[1]*All India Institute of Medical Sciences, New Delhi, India*
[2]*All India Institute of Medical Sciences, Lymphatic Education and Research Network, Sanwari Bai Surgical Centre, New Delhi, India*

Objectives: To assess and compare the effectiveness of MLLB using short stretch bandage against local cotton crepe bandages in the treatment of lower limb lymphoedema in a tropical country where Filariasis is common.

Materials & Methods: Two-arm parallel design open-label randomized controlled trial among ambulatory patients visiting Surgery Department, AIIMS, New Delhi. Inclusion criteria: Patients from both gender above 18 years suffering from lower limb lymphoedema. Exclusion criteria: Patients suffering from arterial disease, those undergoing additional therapy or already on treatment like MLD or compression pumps.
All patients were provided sets comprising of stockinette+cotton roll along with short stretch bandages in the study group and local cotton/crepe bandages for control. First application was over a Picopress. They were asked to revisit twice during the first week, then weekly till 1 month. At end of 1 month all patients got short stretch bandage for selfcare and monitored till 6 months through the parameters as follows. Circumference/Volume, Decrease in Swelling, Pain in walking, Quality of life, Handling of bandage, Ease of use and Patient Compliance.

Results: Total of 60 randomized 30 in each arm - short stretch and control. There was improvement in the quality of life, decrease in the limb circumference for all. Volume decrease was higher in the study group(p=0.023). Study patients required less bandages (3-4 vs 4-8) to achieve minimum effective pressure (40 mm Hg)

Conclusion: Short Stretch Bandages provide better compliance as well as significant volume reduction. Are effective in a tropical setting.

[9] LOW LEVEL LASER THERAPY - REDUCES PAIN AND LOCAL TISSUE WATER IN LOW BACK PAIN -A CASE SERIES

Daniel Loughnan[1]

[1]*Flinders University, Bedford Park, Sa, Australia*

Background: Lower Back Pain (LBP) is a common condition, with a lifetime incidence of up to 84% of the population (1,2). LBP is most commonly secondary to musculoskeletal injury (3) and is associated with localised oedema. Low Level Laser Therapy (LLLT), laser treatment in the wavelength range of 600-1000nm, has been shown to have efficacy in the reduction of oedema and pain in several settings (4,5), and thus it has been postulated that the use of LLLT in LBP may reduce both pain and oedema.

Aim: Follow a LBP patient cohort through a regime of LLLT and compare pre- and post-treatment outcomes in self-reported pain, functionality and local tissue water.

Methods: 5 patients (4 males) were recruited from a LLLT clinic in suburban Adelaide. They were treated with a regime of 8 sessions of LLLT, for 50mins, using a pulsed GaAlAs laser with a wavelength of 808nm and power of 300mW. Self-reported pain was assessed on a numerical pain scale, a Modified Oswestry Low Back Pain Questionnaire was used to assess quality of life and functionality, and local tissue water was measured using the Delfin MoistureMeter D. All parameters were measured before, during and after the treatment regime.

Results: There was significant improvement in terms of local tissue water and pain scoring in post-treatment period ($p<0.05$ and $p<0.01$, respectively). Functionality did not improve significantly.

Discussion: These results support the use of LLLT in back pain. However, given the small study size and heterogeneity of the participants, conclusions are limited.

1. www-uptodate-com.ezproxy.flinders.edu.au/contents/evaluation-of-low-back-pain-in-adults/abstract/1 Deyo RA, Tsui-Wu YJ. Descriptive epidemiology of low-back pain and its related medical care in the United States. Spine (Phila Pa 1976) 1987; 12:264.

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3. National Institute for Neurological Disorders and Stroke. Low Back Pain Fact Sheet. www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Low-Back-Pain-Fact-Sheet. Accessed 8/4/2017.

4. Omar MT, Shaheen AA, Zafar H. A systematic review of the effect of low-level laser therapy in the management of breast cancer-related lymphedema. Support Care Cancer 2012;20:2977–84.

5. Cotler HB, Chow RT, Hamblin MR, Carroll J. The Use of Low Level Laser Therapy (LLLT) For Musculoskeletal Pain. MOJ orthopedics & rheumatology. 2015;2(5):00068. doi:10.15406/mojor.2015.02.00068.

[10] NATURAL COUMARIN AND ROUTINE IN LYMPHOEDEMA TREATMENT

Sandro Michelini[1], Marco Cardone[1], Francesco Cappellino[1] , Alessandro Fiorentino[1]

[1]*Ospedale San Giovanni Battista, Rome, Italy*

Introduction

The phenols represent one of the major classes of secondary metabolites of plants. Of pharmacological interest between the phenols stand out the benzopyrones: the phenylpropanoid derivatives (alpha-benzopyrones) which belong the coumarins and flavonoids (gamma-benzopyrones), of which there are also the structures oligomeric: bi-flavonoids. These substances have a phlebotonic and lymphatic drainage effect.

Material and Methods

The authors studied 50 patients (41 females and 9 males age ranging from 21 and 74 years) with lymphedema of the upper or lower limbs (27 primary, 23 secondary) in clinical stage I and II. They have taken daily for four months orally association of 300 mg rutin with 100 mg of bromelain with 20 mg of natural coumarin. Basal and final circumferences were examined, but also the value of the VAS scale for pain, the basal and final suprafascial thickness at ultrasound and ESR values, PCR, SGOT, SGPT, gamma GT, alkaline phosphatase, bilirubin total and fractionated, basal and final.

Results

At the end of treatment it was observed reduction in limb circumferences, proportional to the clinical stage, average reduction of 17% of the VAS value, average reduction of suprafascial thickness of 27%.

[11] WHICH IS THE PRECISE MISSION OF EACH PARTNER IN TREATING LYMPHEDEMA?

Alexandre Pissas[1]

[1]*University OF Montpellier, General Hospital Bagnols Sur Ceze, Readaptation Hospital OF Pont Saint Esprit , Bagnols Sur Ceze , France*

The authors started their experience in treating patients with lymphedema since 1984 in their unit of treatment of edema in the general hospital of Bagnols sur ceze and from 2017 in the readapted hospital of Pont saint esprit: 3500 income patients were treated during one or two weeks with intensive approach : lymphatic manual drainage ,soft pressotherapy , multilayer bandages , psychological approach….The program of clinical research was approved by the ministry of health of French republic We think that this type of peculiar unit of treatment of edema is not at all in concurrence with physicians , physiotherapists of treat outcome patients in their private structure for each partner has a precise mission :

In the unit of edema an intensive treatment is applied one or two weeks the year and when this treatment is finished the patient must be treated all the life by his physiotherapist one time or two times the week and of course under the responsibility of his physician
So in this scheme, there is no detrimental concurrence.

[12] INVESTIGATING THE EFFECTS OF LYMPHATIC DRAINAGE THERAPIES USING NEAR-INFRARED IMAGING

Peter Worsley[1], Catalina Lopera[1] , Deborah Fenlon[1] , Dan Bader[2]

[1]*University of Southampton, Southampton, United Kingdom*
[2]*Faculty of Health Sciences, University of Southampton, Skin Health Research Group, Faculty of Health Sciences, Southampton, United Kingdom*

Background: Lymphoedema is a chronic peripheral swelling caused by a dysfunction of the lymphatic system, leading to discomfort and loss of limb movement [1]. Therapies to treat or manage lymphoedema have limited evidence, partly due to a paucity in objective measures.

Aim: To determine whether physical therapy and compression garments affect lymphatic behaviour using near-infrared imaging.

Methods: Nine healthy volunteers (age 22-58 years) underwent near-infrared fluoroscopy using a micro-dose (50µL, 0.05%w/v) of indocyanine green to quantify lymphatic behaviour [2] before and after a 15 minute period of manual lymph drainage followed by compression garment (Juzo®, UK) application. Images were taken at the forearm (Fig. 1) and elbow after each intervention. Lymphatic function was defined by the number, size, displacement and speed of lymph packets [2].

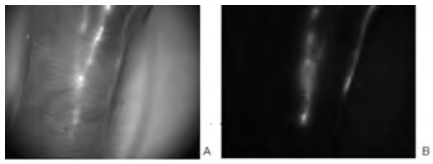

Figure 1. Successful delineation of dermal lymphatic vessels.

Results: Both interventions showed statistically significant improvement ($p<0.05$) in displacement and speed (Fig 2a) at the forearm compared to baseline. The greatest change in lymph behaviour at the elbow was observed in the size of packets, with area significantly increasing ($p<0.05$) post-interventions (Fig 2b).

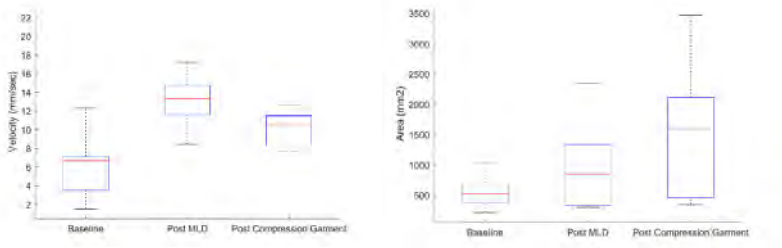

Figure 2. Box and whisper plot of a) lymph velocity at the forearm, b) lymph packet size at the elbow.

Conclusion: Lymphatic activity increased following manual lymphatic drainage and compression garment therapies. NIR fluoroscopy has the potential to provide an insight into lymphatic behaviour and an objective means to test the efficacy of interventions.

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1. Maunsell E, et al: *Can. J. Surg.* 1993;36(4):315-320.
2. Gray RJ, et al: *Med. Eng. Phys.* 2016;38(9):895-903.

[13] QUANTITATIVE EVALUATION OF BICOMPARTIMENTAL LYMPHOSCINTIGRAPHY IN LOWER LIMB LYNPHEDEMA

Giuseppe Villa[1], Corrado C. Campisi[2] , Stefano Spinaci[3] , Lidia Molinari[2] , Sara Dessalvi[2] , Gianmario Sambuceti[1], Francesco Boccardo[2]

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[3]Irccs Az Osp Univ San Martino– Ist , Genova, Italy

Lymphoscintigraphy can identify several pathological findings in lymphatic disorders. In spite of qualitative analysis has been reported to be very accurate in lymphedemas, a quantitative approach offers an objective measure for lymphatic function, based on the appearance time of activity in the nodes, percentual nodal activity or hepatic uptake at delayed acquisition.

Forty subjects suffering from monolateral of bilateral lymphedema of lower extremities (stage 1 and 2) underwent bicompartimental lymphoscintigraphy. It was performed in different days by injecting 30 MBq of technetium 99m-nanocolloid subcutaneously and 48 hours later subfascially, in order to explore superficial and deep lymphatic circuits. Kleinhans TI, percentual activity in inguinal nodes and in the liver were calculated.

TI and inguinal nodes/sites of injection uptake ratio showed a very high statistical correlation (r -0.79 and -0.61). Average TI was respectively 22,3 ±2.03 and 13.5 ±3.1, percentual nodal activity was 3.6 ±0.84 and 13.5 ±3.1. Statistical correlation between hepatic uptake and TI was not significant. Hepatic uptake after study of superficial (1.34 ± 0.35) and deep circuits (1.84 ± 0.26) are significantly different ($p<0.01$). Inguinal nodes/injection site uptake ratio is significantly higher through deep circuits.

TI is an objective scoring system and quantitative analysis, simply obtainable. TI demonstrate a high correlation with nodal activity and with clinical status. Hepatic uptake reflects the patency of the lymphatic ducts until the subclavian vein and the presence of microshunts between periferic vascular and lymphatic spaces. The subfascial injection will affect a more rapid clearance of the tracer in the systemic circulation.

[14] HOW THE USE OF INDOCYANINE GREEN (ICG) FLUOROSCOPY IS HELPING TO IMPROVE THE SUCCESSFUL MANAGEMENT OF LYMPHOEDEMA

Denise Hardy[1]

[1]*Kendal Lymphology Centre, 64 Stramongate, Kendal, United Kingdom*

Introduction: Although not available on the NHS, ICG fluoroscopy is being increasingly offered to patients at risk of developing lymphoedema and those with mild to moderate swelling. Two case studies (consent granted) demonstrate the benefits of this investigation in planning lymphoedema treatment.

Description: 0.1cc of ICG dye is injected subcutaneously to the hand or foot where it is taken up by the lymphatic system. Using an infra-red camera, the lymphatics can be visualised giving a real-time dynamic assessment of lymphatic function and a quantitative and qualitative assessment of lymphoedema. Furthermore, the live imaging demonstrates the effect of lymphatic massage as the dye can be seen being pushed along intact lymphatics and alternative pathways (Ramsden 2014).
In one case, the results demonstrated that the patient no longer required compression. In the other case surgical intervention was indicated which has completely resolved the lymphoedema.

Implications: Although ICG Fluoroscopy has the practical advantage of being portable and less expensive than other imaging techniques, it requires injection of a prescribed medication and is not yet available to all practitioners.

Conclusions and recommendations: The use of ICG fluoroscopy imaging is changing the traditional approaches to lymphoedema treatment and as a result we can more accurately confirm the presence or absence of lymphedema. This enables a more customised and successful treatment plan that may include either, or both, conservative and surgical approaches.

Refs: Ramsden A (2014) Imaging and screening for lymphoedema. LSN LymphLine Winter ’14; 5-7

[15] COMPARATIVE STUDY BETWEEN STANDARD ULTRASOUND DEVICE AND POCKET ULTRASOUND DEVICE FOR THE EVALUATION OF THICKNESS IN SUBCUTANEOUS TISSUE FOR FOREARM IN HEALTHY SUBJECTS

Misako Dai[1], Junko Sugama[2] , Hiroko Maeba[3] , Takuto Sawazaki[4] , Mayumi Okuwa[1]

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Introduction and aim: Ultrasonography is useful for lymphedema management to assess subcutaneous tissue. However, Standard Ultrasound Device (SUD) is difficulty to use in multi place at hospital and home care setting. Pocket Ultrasound Device (PUD) offer comparable performance to SUD, but assessment of subcutaneous tissue may be poor. The purpose of this study was to evaluate the validity of measuring thickness of PUD compared with the SUD.

Methods: This observational study examined in Japan between April and July 2015. 51 healthy adults (average age 41.5 ± 20.8 years; body mass index 23.2 ± 4.8 kg/m^2; no significant difference in right and left upper limb circumferences) participated. SUD and PUD were also calculated correlation and limits of agreement (LoA) as external validity. All protocols were approved by the ethics committee at Kanazawa University (No. 587).

Results: We investigated 102 upper limbs from 51 participants. In qualitatively, all images could be defined subcutaneous tissue from finding dermal layer and deep fascia. In quantitatively, the Pearson coefficients of correlation determined from SUD and PUD was high (R^2=0.86; P<0.01); the Bland-Altman plot showed slightly higher values were obtained between the thickness by PUD: the difference SUD- PUD was 0.320 (LoA; -0.64 to 1.28).

Conclusion: Our findings provide PUD is an innovative method of measuring thickness for subcutaneous tissue that could be used instead of SUD. It will be needed studying for lymphedema patients in clinical setting.

[16] POCKET ULTRASOUND DEVICE VERSUS STANDARD ULTRASOUND DEVICE FOR IMAGING OF SUBCUTANEOUS TISSUE IN LOWER LYMPHOEDEMA PATIENTS

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Introduction and aim: Pocket Ultrasound Device (PUD) is an innovative method to assess subcutaneous tissue (ST) that could be used instead of Standard Ultrasound Device (SUD), which is also useful but has its limitations. We compared the image quality of SUD with PUD for ST in lower lymphoedema patients (LLE).

Methods: Twenty legs in 10 women with LLE were examined. Their median age was 59 years old (range 41-81) and they were all secondary, ISL late II. A physician of lymphoedema got ultrasound images on the thigh and leg, then, a researcher analyzed these images qualitatively. The images of dermal layer and deep fascia to define ST were classified as poor, fair, or good. Subcutaneous echogenicity, echogenic line and echo-free space (EFS) were assessed. All protocols were approved by the ethics committee at Kanazawa University (No. 587).

Results: We investigated 120 ultrasound images from 10 participants. The percentage of “good” by PUD was higher than SUD (PUD: 68.9%, SUD: 53.4%) in dermal layer, on the other hand, PUD was lower in deep fascia (PUD: 77.5%. SUD: 81.0%). Echogenicity showed that the 11.7% in PUD was “low”, while all images showed “increased” in SUD. In echogenic line, 73.3% in PUD showed “clearly”, compared to 50.0% in SUD. In EFS, 5% in PUD showed “free-space”, while 13.3% free-space in SUD.

Conclusion: PUD will able to define ST and able to measure thickness of ST. However, it has a limitation in assessing the contents of ST to clarify the pathological condition in LLE.

[17] DEEP INFRARED IMAGING TO IDENTIFY VENOUS IMPAIRMENT AFTER BREAST CANCER SURGERY

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Introduction: Breast cancer related lymphedema (BCRL) is commonly attributed to axillary lymph node dissection (ALND) and reduction of lymph flow. Impairment of the axillary vein seems to contribute also to BCRL, leading to a deep pitting edema of hand and forearm. When a patient with axillary vein impairment stands up, hand skin looks rapidly hyperaemic, due to a vasodilation of the capillaries. This vascular situation may result from removal of the fatty tissue containing lymph nodes, and disruption of the good emptying of the axillary vein. The orthostatic intermittent venous stenosis induces collateralizations which are derivative evidence of the axillary vein impairment. We highlight them using an original and easy procedure, based on a deep infrared imaging (DIRI) device.

Material and methods: A total of 100 women were recruited, 50 BCRL patients and 50 healthy women as a control group. In all subjects, we performed visible light and DIRI pictures of the thorax, including neck, shoulders and upper arms. Images were mixed and screened by 3 blind operators. The operators screened for differences in thermograms, such as asymmetric and collateral trajects.

Results: The DIRI coupled with our reading grid seems to be specific and sensitive enough to identify BCRL patients with asymmetric collateralization of the axillary vein.

Conclusion: DIRI and its reading grid seems to be a useful tool in daily clinical practice to evaluate the hemodynamic changes of the axillary vein in BCRL patients. This evaluation gives us more insight in the (future) development and eventual treatment of BCRL.

[18] LIVE INDOCYANINE GREEN LYMPHOGRAPHY SHOWS DIFFERENCES IN EFFECTIVENESS OF MLD, LINFOROLL MASSAGE AND INTERMITTENT PNEUMATIC COMPRESSION

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Background: In lymphedema of limbs (LLed) main lymphatic trunks are obstructed and flow of edema tissue fluid (TF) may occur through spontaneously formed tissue "channels" and subepidermal lymphatic plexus previously called "dermal backflow". Classic lymphoscintigraphy can depict only sites of accumulation of edema TF but not its movement during compression procedures. Indocyanine green lymphograhy (ICGL) is more effective and can show TF movement at the tissue depth of 15mm. Pictures of the flowing TF allow application of effective massage pressure and timing.

Aim: To observe edema TF flow in lymphedematous lower and upper limbs during manual and Linforoll devise massage and intermittent pneumatic compression.

Material and methods: Twelve patients with LLed of lower and twelve of upper limb stage II and III were investigated. ICG was injected between toes or fingers. Massaging started immediately after injection to avoid dye binding with tissue proteins. In groups of 4 classic MLD, Linforoll and IPC compression were applied. Linforoll massage pressure is shown on computer screen, that of IPC is selected on devise prior to massage. In all groups pressures ranged from 80 to 120 mmHg. Visual evaluation of TF flow was done. I some cases local fluorescence intensity was measured.

Results: MLD required forced pressure upon tissues to move radially TF and there was fast backflow upon removal of the massaging hand. Linforoll effectively moved TF unidirectionally without immediate backflow and rolling had to be repeated. IPC moved TF unidirectionally without backflow but 50 sec compression was not enough TF to flow a distance of 9 cm (length of inflated chamber).

Conclusions: IPCL is helpful in evaluation of edema TF flow and should be used in studies of effectiveness of various types of massaging.

[19] LYMPHATIC MICROSURGERY FOR AN EARLY AND EFFECTIVE TREATMENT OF PERIPHERAL LYMPHEDEMA

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In the past 40 years there has been a burgeoning interest in research on, and clinical application for, diseases involving the lymphatic system. Diagnostic and histo-pathological studies of lymphatic diseases have allowed a better understanding of the etiological aspects and pathophysiological mechanisms responsible for the complex clinical features correlated with lymphatic dysfunctions. Development of microsurgical techniques has significantly advanced the field of Lymphology and the scientific community has recently become interested in preventing lymphatic lesions during oncological surgery. Recent research has emphasized the significant incidence of lymphatic lesions resulting in lymphedema after oncological and venous surgeries. In addition, other factors, such as BMI and individual anatomical variations have emerged as contributing to the rate of lymphedema. It is therefore essential to individuate the lymphatic pathways prior to surgical treatment.

The authors' wide clinical experience in the treatment of patients with peripheral lymphedema by microsurgical techniques ("single-site" Multiple Lymphatic Venous Anastomoses, MLVA) is reported (over 4000 cases with a follow-up of at least 5 years, to approximately 20 years), including randomized controlled trials of the LyMPHA procedure in oncological surgery. New imaging technology improves the microsurgical experience and can be used in a lymphatic-sparing approach; both in the prevention of lymphedema (Ly.M.P.H.A) and in the treatment of chronic lymphedema with fibrosis (Fibro-Lipo-Lympho-Aspiration – FLLA, with lymph vessel sparing procedure).

[20] LYMPHA TECHNIQUE FOR PRIMARY AND EARLY SECONDARY PREVENTION OF LYMPHEDEMA FOLLOWING CANCER TREATMENT

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Introduction

LYMPHA was conceived and carried out about 10 years ago and the preliminary results were published few years after (Boccardo F et al, 2009). This technique was initially applied to prevent breast cancer related lymphedema and a short term follow-up outcome was reported (Boccardo et al, 2011).

Methods

A longer term follow-up period demonstrated the efficacy of LYMPHA technique, which proved to be advantageous to prevent secondary arm lymphedema (Boccardo et al, 2014). Other groups started to use LYMPHA technique and reported their experience showing that LYMPHA is feasible, safe and effective for the primary prevention of breast cancer- related lymphedema (Feldman et al, 2015). By now LYMPHA is reported among surgical interventions for lymphedema prevention (Penha, 2015; Merchant, 2015; Ahn, 2016). After this experience using LYMPHA to prevent arm lymphedema, we started to apply the same technique to prevent lower limb lymphedema following inguinal lymphadenectomy for the treatment of melanoma of the trunk (Boccardo et al, 2013) and vulvar cancer together with our colleagues gynecologists (Morotti, Valenzano, Boccardo, 2014). After 4 years' follow-up, encouraging results of LYMPHA technique to prevent lower limb lymphedema following groin dissection for vulvar cancer and melanoma were reported (Boccardo, 2016).

Results

LYMPHA proved to be an effective preventive procedure that contributes in giving our oncological patients a good quality of life.

[21] PERCEPTIONS AND ATTITUDES OF PEOPLE UNDERGOING LYMPHATIC VENOUS ANASTOMOSIS

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Introduction
In September 2015, a three-year national programme for people with mild/moderate lymphoedema to access Lymphatic Venous Anastamosis (LVA) commenced in Wales. A maximum of 42 people can access this innovative surgery on the NHS per annum. Each of the seven Health Board Lymphoedema Clinical Leads, are the gatekeepers in referring eligible patients for LVA screening. Limited in-depth qualitative data exists in establishing the impact of LVA on quality of life. This clinical research study was funded by a Tenovus Cancer Care Grant.

Aim
The aim of this study was to qualitatively explore the impact of LVA on people with lymphoedema health and wellbeing.

Methods
Following ethical approval, sixteen participants eligible for LVA surgery were recruited via purposive sampling. To explore impact on health and well-being, in-depth digitally recorded interviews were completed pre and 6-months post LVA surgery.
Constant comparison analysis (Green & Britten, 1998) was used to investigate the data.

Results
Key findings before LVA surgery included: 'impact of living with lymphoedema', 'being different' and 'fear of the future'. Post LVA the identified themes were: 'feeling lucky' and 'returning to former self'.

Conclusions
All but one participant reported that LVA has had a positive impact on health and wellbeing; even those still wearing compression garments. The daily use of compression garments on people's lives must not be underestimated. It is vital that health care professionals ascertain the effect garments will have on work, hobbies and relationships. Many of the participants recognised their need for psychological support.

[22] LYMPHO-VENOUS ANASTOMOSIS (LVA) SURGERY IN NHS WALES - A SERVICE EVALUATION

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Introduction / background: LVA offers a potential curative result for people with lymphoedema. In 2015 collaboration between the NHS, Welsh Government and patients agreed a two-year trial to determine the benefits of LVA surgery.

Aims: To determine whether LVA will stop recurrence of cellulitis; reduce the need to wear compression garments and improvement in Quality of Life.

Methods: ABMUHB Directorate and R&D approval given. Patients assessed on stringent criteria and will be followed up for 5 years. Post-operative care includes no garments for three days, then resume normal garment usage; no driving or strenuous activity for two weeks. Data includes cellulitis episodes pre-and post-op, circumferential limb volume, perometer, bio-impedance; as well as Distress Thermometer, Pain/ Heaviness Visual Analogue Scale and EQ-5D-5L questionnaire. Statistical analysis using Student's ***t***-test will be used to evaluate the results to date.

Results: The first year results include one episode of cellulitis post-op (reduction of 98%); a mean volume reduction of 3%; however, 6 patients are now out of compression garments, and a further 4 are being tapered out of garments. Pain and heaviness reduced by 50% and 48% respectively. Distress scores reduced by 26% and EQ-5D-5L scores improved by 57%.

Conclusions: Our current data falls within reported literature outcomes. It is worth investigating whether stringent criteria do improve surgical outcomes. Post-operative protocol requires consensus as current literature descriptives are poor.

[23] SURGICAL TREATMENT OF ADVANCED LIPEDEMA

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Introduction Lipoedema is a chronic debilitating condition in women, often misdiagnosed as obesity. The main feature is the bilateral progressive accumulation of subcutaneous fat in the lower trunk, legs (without involvement of feet) and sometimes arms.
Although conservative treatment in stages I and II is of benefit, in stage II and III surgery seems inevitable. In advanced lipedema traditional liposuction is not the final answer.
Patients referred to our centre mostly are “end stage III” often presenting with impaired locomotion caused by gross anatomical defects and suffering from extensive comorbidity

Aims of study Description of the surgical aspects in a multidisciplinary approach to advanced lipoedema.

Methods Surgical debulking by liposuction, longitudinal excision and three-dimensional reconstruction. The goal of this approach is to restore functionality, reduce pain and swelling, improve the physical appearance and the quality of life.
All procedures were carried out by vascular surgeons under general anaesthesia

Results From 2007 - 2016 a consecutive group of 32 women mean age 57 years (36-75) with predominantly Class III lipoedema underwent 66 procedures. The mean BMI was 47 kg/m^2 (26-81) with 66% comorbidity like thyroid malfunction, DM, pulmonary embolism and sleep apnoea. Admission period was 4 weeks (1-12). Haematoma developed in 3 patients, abscess in 1, partial skin necrosis in 3. All patients recovered by conservative treatment; four patients needed surgical intervention.

Conclusion Patients with advanced stage III lipoedema, can be treated surgically in a multidisciplinary approach with good results at the cost of temporary complications and 0 mortality.

[24] NEW SURGICAL OPTIONS FOR THE TREATMENT OF ADVANCED STAGES OF PERIPHERAL LYMPHEDEMA

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Background: Development of microsurgical techniques has significantly advanced the field of Lymphology and the treatment of lymphedema.
Methods:Our "single-site" microsurgical technique identifies, by Patent Blue Dye / Fluorescent Micro-lymphography (PDE Test), the lymphatics in the axillary or groin and completes derivative multiple lymphatic–venous anastomoses (MLVA). In cases of advanced lymphedema, we use a recently developed Fibro-Lipo-Lymph-Aspiration technique with a Lymph Vessel Sparing Procedure (FLLA-LVSP) where microlymphography techniques highlights the lymphatic pathways and the excess adipose tissue is carefully aspirated.

Results: With "single-site" MLVA, 4000 patients obtained significant reductions in excess limb volume of over 85%, with an average follow-up of 15 years plus. Over 87% of patients with earlier stages of disease progressively stopped using conservative therapies and 42% of patients with later stages decreased the frequency of physical therapies.
For 250 advanced cases involving the upper limb, there was an average pre-surgery excess volume of 20.19%, which reduced to 2.68% after the FLLA-LVSP (Z-score =-6.90, $p<0.001$). Similarly, for the lower limb, there was an average pre-surgery excess limb volume of 21.24% and a reduction to 2.64% post-operatively (Z-score=-3.57, $p<0.01$).

Conclusion: MLVA techniques when performed at a single-site produce excellent outcomes in the treatment of lymphedema, giving the possibility of complete restoration of lymphatic flow in the early stages of when tissue changes are minimal. In cases of advanced lymphedema, the FLLA-LVSP is efficient with immediate cosmetic results. More importantly, the removal of excess tissue is completed without further damage to lymphatic vessels.

[25] DO HYDROCEPHALUS SHUNTS HAVE A ROLE IN THE SURGICAL TREATMENT AND PREVENTION OF LYMPHOEDEMA?

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Introduction
Lymphoedema is a consequence of impaired lymphatic drainage. Various treatment options are available with varying degrees of efficacy and impact on the individual. Whilst all are useful in reducing the extent and impact of lymphoedema, there are confounding factors such as patient compliance, financial and physical costs and the often-unpredictable variable outcomes. There seems to be no single treatment that is affordable, effective and sustainable for patients with or at risk of lymphoedema.

Description
Hydrocephalus shunts allow cerebrospinal fluid (CSF) to circumvent an obstruction during periods of impaired absorption, removing the build-up of fluid that causes hydrocephalus. Shunts work on a low-pressure system, and generally consist of a ventricular catheter, a one-way valve, and a distal catheter.
Normal human limb pumping pressures have been recorded to be between 10 and 60mmHg, whilst maximum pressures recorded in failing lymphatics is approximately 50-60mmHg. As hydrocephalus shunts work on pressures as low as 15-25mmHg at flow rates as low as 5ml/hr it is plausible that they could be used to prevent retrograde flow of lymph in failed lymphatics, thereby reducing lymphoedema.
Preliminary testing is underway. Pig leg lymphatics will be anastomosed to the shunt and the flow of lymph through the shunt imaged using either indocyanine green (ICG) or patent blue. Results will be available and discussed by the time of the conference.

Conclusion
The use of hydrocephalus shunts in the treatment and prevention of lymphoedema would greatly reduce the need for other interventions that require higher patient compliance and ongoing management.

[26] HOW TO PREVENT LYMPHATIC INJURIES IN VENOUS SURGERY

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Introduction

Lymphatic complications after great and small saphenous vein surgery have a variable incidence. Authors developed a protocol to be applied to all patients undergoing venous surgery in order to avoid lymphatic injuries.

Methods

Between January 2010 and December 2015, 76 patients with lower limb venous insufficiency and varices were studied and treated. Blue Dye was injected distally in all patients. Blue lymph nodes and lymphatics were identified and preserved or used to perform Multiple Lymphatic-Venous Anastomoses (MLVA) with a competent collateral venous branch. Patients were followed up clinically and instrumentally (3 months - 6 years).

Results

The mean age was 55,16 years (26 men and 50 women). Color Doppler duplex ultrasound was done in all patients. Lymphoscintigraphy was performed in 35 patients. 58 patients were treated by greater saphenectomy and varicectomy; 10 patients crossectomy and varicectomy; 5 patients MLVA, greater saphenectomy and varicectomy; and 3 patients were treated by stripping of the small saphenous vein and varicectomy. No lymphatic complications occurred. An improvement in volume was observed in 5 patients treated by MLVA. Lymphoscintigraphy demonstrated no post-operative lymphatic impairment.

Conclusions

An accurate diagnostic investigation and proper surgical technique associated with microsurgical procedures demonstrated to be of paramount importance in avoiding lymphatic complications during venous surgery and in treated combined lymphatic and venous insufficiency.

[27] LONG TERM RESULTS OF CIRCUMFERENTIAL SUCTION-ASSISTED LIPECTOMY IN THE TREATMENT OF PRIMARY AND SECONDARY END-STAGE LYMPHOEDEMA OF THE LEG IN 88 CONSECUTIVE PATIENTS

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Background: The treatment of end-stage lymphoedema of the leg is challenging, especially when conservative treatment fails. Circumferential suction-assisted lipectomy (CSAL) is a treatment option for end-stage lymphoedema of the leg.

Aims of study: To evaluate the results of CSAL treatment in end-stage primary and secondary lymphoedema of the leg, with a 2-year follow-up.

Methods: This was a descriptive study of patients treated with CSAL for unilateral chronic irreversible lymphoedema of the leg. Compression therapy was resumed after surgery. Leg volumes were measured before surgery, and at 1, 6, 12 and 24 months after the procedure.

Results: A total of 47 patients with *primary* lymphoedema had a median preoperative volume difference between affected and unaffected legs of 3686 (IQR 2851–5121) ml. Two years after surgery, this volume difference was reduced to 761 ml, a 79% reduction.
In the 41 patients treated for *secondary* lymphoedema, the median preoperative volume difference was 3320 (IQR 2533–4783), decreasing after 2 years to –38 ml (a 101% reduction). A larger preoperative volume difference and the male sex of the patient significantly negatively influenced the final outcome after 2 years. The outcome was not related to BMI or any other patient characteristics.

Conclusion: CSAL is safe, effective and the method of choice for treating both primary and secondary lymphoedema of the leg with excellent long term follow-up results. Male patients had a noticeable larger volume difference after two years versus their female counterparts, emphasizing the need for a more pro-active follow-up schedule.

[28] LIPOFILLING OF THE AXILLA TO REDUCE SECONDARY LYMPHEDEMA AFTER AXILLARY LYMPH NODE DISSECTION

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Introduction: Upper limb lymphedema remains a frequent complication (3-60%) of axillary lymph node dissection (ALND) for breast cancer. Part of these lymphedema present also venous impairment. During surgery, adipose tissue surrounding the axillary vein is removed and the axillary sheath can also be damaged. This anatomical disruption could reduce the local hemodynamic condition, and increase microvascular filtration at the distal part of the affected limb. Patients with a venous impairment after ALND present clinical signs that allows us to identify them. In order to reduce their edema, we propose an original and simple surgical approach that could partially restore the axillary hemodynamic impairment.

Material and Methods: BCRL patients with positive clinical signs for axillary hemodynamic changes underwent lipofilling under the axillary vein. Patients remain without any treatment nor sleeves during 10 days after surgery. Precise volumetry was performed the day before, the day after and 10 days after surgery. Subjective symptoms were also evaluated.
Results: 49 BCRL patients underwent lipofilling surgery. Edema volume reduced significantly in the majority of patients. Subjective symptoms like heavy arm, numbness, and functional impairment of the upper limb in daily activities started to decrease directly after the operation. After 36 months of follow up, no complications were recorded.

Conclusion: In selected BCRL patients, lipofilling under the axillary vein improves local hemodynamic, reduces distal hyperfiltration and consecutively reduces part of the edema. Results of this pilot study need to be empowered by multicentric studies.

[29] SUPERMICROSURGICAL LYMPHATICOVENULAR ANASTOMOSIS AND LYMPH NODE FLAP TRANSFER FOR THE TREATMENT OF PERIPHERAL LYMPHEDEMA

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Introduction: Lymphedema is a chronic, progressive and debilitating disease affecting around new 40.000 cases in Italy. In developed countries, extremities lymphedema secondary to oncologic treatments represents the main etiopathogenesis of this disease and this trend will very likely be maintained in the next years due to the increasing number of cancer survivors. Since a decade, microsurgical treatments for extremities lymphedema has been introduced and promising results have been experienced. Those treatments include lymph node free flap transfer (LNF) and supermicrosurgical lymphaticovenular anastomosis (LVA).

Description: From January 2014 to January 2017 85 patients affected by primary and secondary extremities lymphedema underwent LVA or supraclavicular LNF prior reverse mapping.
Patients' data, lymphoscintigraphy, lymphography, ISL staging, circumpherence, previous treatments, numbers of previous cellulitis/lymphangitis, smoking, BMI were collected. Postoperative results were evaluted at 1, 3, 6 and 12-month follow-up by means of quantitative (circumpherence and lymphedema related signs and symptoms), qualitative (lymphoscintigraphy) and quality of life questionnaire (lymQoL).

Implications: All patients reported quantitative, qualitative and QoL improvement, with a mean circumpherence reduction 40,5% (ranging from 10% to 68,5%). Perioperative and postoperative physical treatments boosted the surgical treatments.

Conclusions/recommendations: New microsurgical treatments for lymphedema represent a promising therapeutical weapon. Preoperative diagnostic examinations are mandatory for the choice of the procedure to offer. Perioperative and postoperative physical treatments should be always combined with surgery for maximizing results.

[30] AUTOLOGOUS BREAST RECONSTRUCTION AND LYMPH NODE FLAP USING ABDOMINAL PERFORATOR FLAPS: SINGLE-STAGE TOTAL BREAST AND UPPER LIMB LYMPHEDEMA RESTORATION

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Introduction: In developed countries, around 90% of female upper limb lymphedema cases are secondary to breast oncologic treatments. Autologous breast reconstruction using free abdominal perforator flaps represent a golden standard. However, this procedure allows to restore the breast shape only without improving upper limb edema. Since a decade, microsurgical treatments for extremities lymphedema has been introduced including lymph node free flap transfer (LNF) with promising results. The combination of DIEP flap with inguinal nodes is also known as LymphDIep Flap.

Description: From January 2014 to January 2017 20 patients affected by secondary upper limb lymphedema needing autologous breast reconstruction underwent LymphDiep procedure. Reverse mapping was undertaken to avoid lower extremity jatrogenic lymphedema.
Patients' data, lymphoscintigraphy, lymphography, ISL staging, circumpherence, previous treatments, numbers of previous cellulitis/lymphangitis, smoking, BMI were collected. Postoperative results were evaluted at 1, 3, 6 and 12-month follow-up by means of quantitative (circumpherence and lymphedema related signs and symptoms), qualitative (lymphoscintigraphy) and quality of life questionnaire (lymQoL).

Implications: All patients reported quantitative, qualitative and QoL improvement. No lower limb jatrogenic lymphedema were experienced. Perioperative and postoperative physical treatments boosted the surgical treatments.

Conclusions/recommendations: LymphDIep allow to reconstruct the breast and restore upper limb lymphedema in a single procedure. Perioperative and postoperative physical treatments should be always combined with surgery for maximizing results.

[31] EARLY DETECTION OF SECONDARY LYMPHEDEMA AFTER CANCER TREATMENTS

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Introduction All patients undergoing an axillary dissection, are at risk to develop a secondary lymphedema. Currently, lymphedema is diagnosed only after its clinical onset.
Sensitive detecting tools are needed to identify accurately pre-clinical signs of secondary lymphedema. Near infrared fluorescence lymphatic imaging (NIRFLI) could be the answer to this need. NIRFLI exams performed on lymphedematous patients highlight that the superficial lymphatic architecture shows typical abnormalities in comparison with healthy subjects.
This study aims to confirm the possibility to detect secondary lymphedema at a subclinical stage and to implement early treatments.

Method Breast cancer patients are recruited before surgery. They undergo a high accurate volumetry of both upper limbs and NIRFLI of the limb of the operated side. Six sessions of measures and imaging are planned: before surgery and then, 10 days, 3 months, 6 months, 1 year and 2 years after surgery. The evolution of volumetry and lymphatic architecture are stated and compared along the time.

Results On 44 consecutive patients, 5 patients presented changes in NIRFLI and developed lymphedema afterwards. Two patients present minor changes in NIRFLI and up until now have not developed lymphedema. The 37 other patients have no change in NIRFLI and no lymphedema.

Conclusion Primary results indicate that NIRFLI seems to be a promising sensitive tool to detect the imminent risk of development of secondary lymphedema. Continuous follow-up and an increased number of patients would strengthen these results.

[32] INDOCYANINE GREEN LYMPHOGRAPHY IS HELPFUL IN DETECTION OF EARLY LYMPHEDEMA AFTER BREAST AND UTERINE SURGERY BEFORE IT IS CLINICALLY DIAGNOSED

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Background. Around 40 % of postmastectomy and 25% posthisterectomy lymphedema are registered and numbers are increasing with longevity of patients. The development of lymphedema could be controlled if the early diagnosis were made.

Aim. To early diagnose lymph stasis in postmastectomy and posthisterectomy patients using indocyanine green lymphography (ICGL) before it is detected by the patient. Materials and methods. Twenty patients first year after axillary lymphadenectomy and twenty after histerectomy without visible edema of the limbs underwent ICG lymphography and pattern of lymphatics and sites of tissue fluid stagnation were evaluated. Time of ICG transport to proximal part of limbs was estimated.

Results. Postmastectomy. ICG accumulated in all patients at axillary pit, did not move across it but spread laterally displaying a dense meshwork picture. Time ICG reached arm pit was 2-3-times longer than on healthy side. Posthisterectomy. ICG reached groin region to produce a picture of a mesh sometimes very limited but evident. In few cases it was seen in the hypogastrium. In other few it was seen on both sides, however, one side dominated with larger area of stagnation.

Conclusions. ICG lymphography is a useful diagnostic tool for early detection of lymph stasis leading to formation of lymphedema.

[33] INDICATION TO GENETIC TESTING FOR PATIENTS AFFECTED BY PRIMARY LYMPHEDEMA

Matteo Bertelli[1]

[1] *Magi's Lab Human Medical Genetics Institute, Italy*

Introduction: Primary lymphedema is characterized by altered morphological development of lymphatic vessels causing fluid accumulation in interstitial spaces. An accurate diagnosis of lymphedema is essential for appropriate therapy, adequate follow-up, also allowing for pre-symptomatic interventions.

Aims of study: In most patients, the diagnosis of lymphedema can be readily determined from the clinical history and physical examination while in other patients the clinical picture is complicated by confounding conditions. Given the great genetic heterogeneity shown by lymphedema, our aim was to develop a Next-Generation-Sequencing (NGS) approach for lymphedema genetic testing.

Methods: In this study we describe the development of a NGS custom-made oligonucleotide probe library for the simultaneous analysis of the coding exons and the flanking exon/intron boundaries of 12 genes (CCBE1, FLT4, FOXC2, GATA2, GJC2, HGF, KIF11, MET, SOX18, VEGFC, CELSR1, FAT4).

Results: Patients selection is made on the basis of clinical symptoms presence evaluated by three-phase lymphoscintigraphy, color Doppler echography and magnetic resonance lymphangiography, presence of family history with Mendelian inheritance, presence of either syndromic features or not, and more importantly exclusion of secondary causes of disease (ie lymphedema is triggered by an external event such as filariasis, mechanical trauma, radiation therapy or tumors).

Conclusions: Genetic testing by NGS, given its practical and commercial availability, has become the gold standard to screen for a number of abnormalities in various genes known to be associated to lymphedema. The emerging era of molecular diagnosis is likely to result in improved understanding, evaluation and treatment of patient affected by primary lymphedema.

[34] CHARACTERIZATION OF FOXC2 VARIATIONS IDENTIFIED IN PATIENTS WITH LYMPHEDEMA-DISTICHIASIS SYNDROME

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Introduction: Genetic variations in the Forkhead Box C2 (***FOXC2***) gene cause the dominant lymphedema-distichiasis syndrome. ***FOXC2*** is important for the normal development and maintenance of venous and lymphatic valves. Most of ***FOXC2*** variations described so far either truncate the protein or are missense variants in the forkhead domain causing a loss of function. In literature, haplo-insufficiency has been associated with a generalized hyperplasia of lymphatic vessels in both mice and humans.

Aims of study: In this work, we present the functional characterization of six ***FOXC2*** genetic variations previously described in six lymphedema-distichiachis families to get further insight into the disease-causing mechanism of lymphedema.

Methods: Four of these are missense variants (p.A3G, p.S370T, p.L487P, p.A492V), one a stop variant (p.Q420X) and the last one a frameshift variant (p.M276DfsX186). We evaluated the pathogenic potential examining the subcellular localization and the transactivation activity of the six resultant mutated proteins.

Results: We show that all mutated proteins are able to correctly localize in the nucleus; half of these variants show the ability to activate FOXC1/FOXC2 response elements, while the remaining variants cause an increase of protein transactivation activity.

Conclusions: Our results suggest that either a complete loss or a significant gain of FOXC2 function can cause a perturbation of lymphatic vessel formation leading to lymphedema.

[35] THE DEVELOPMENT OF A NEW PAEDIATRIC LYMPHOEDEMA SERVICE FOR WALES

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Aims

To develop a standardised comprehensive paediatric lymphoedema service in Wales, with a vision of 'Children and young people in Wales with lymphoedema have local access to expert assessment, diagnosis and evidence based management of their condition'.

Description

Since 2011, Wales has provided an inclusive lymphoedema service for all adults. However, access for children was adhoc achieved through commissioning grants with no clear pathway based on need. Welsh Government supported the development of a National Paediatric Lymphoedema Service in Nov 2015. The work plan is governed by a National Paediatric Lymphoedema Board and is managed by 'Managing Successful Programmes' principles. Management, Clinical therapists, stakeholders from around Wales are represented on the programme board ensuring that decision making and planning is a collaborative initiative.
In the first year:
130 children and young people have been assessed and treated; primary/secondary
A dedicated Lymcalc database has been established to gather relevant data
A referral and assessment form was devised
Raising awareness sessions amongst healthcare professionals and collaborative clinics is ongoing
The first accredited paediatric lymphoedema education day planned (9th Feb 2017) with Agored Cymru
A Family 'Lymph Adventure' event for summer of 2017
A shoe project in collaboration with Cardiff Metropolitan University
The creation of two video prescription films one for children, one for families

Evaluation

Having received ethical approval, Swansea University are carrying out qualitative research to discover the perspectives of children, young people, and their families on the new service.

[36] "LYMPHALETICS": OVERCOMING BARRIERS FOR CHILDREN WITH LYMPHOEDEMA

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Aims

Primary lymphoedema in children is relatively rare and poorly recognised, often resulting in long delays in referral to appropriate treatment centres. This inevitably leads to detrimental effects on the physical and psychosocial wellbeing of such children and their families (Todd et al 2010).
To try and re-dress this, The Children's Lymphoedema Special Interest Group (CLSIG) has developed dedicated events (Lymphaletics) for children with lymphoedema to encourage physical activity and social interaction, and to provide a source of parent-to-parent support.

Description

The events have been designed to provide children with lymphoedema (and their families) to meet each other with a similar condition. In a supportive/safe environment, the days provide a mixture of fun filled exercise-based activities including team games, water and sensual therapies, alongside educational seminars, an arena to meet the manufacturers and a network for everyone to maintain contact after the day is over.

Outcome

Three events (held bi-annually) have enabled lymphoedema specialists to address some of the problems facing children with lymphoedema. Quantitative data of the days is gathered, but positive qualitative data is also captured through an online survey tool to demonstrate how beneficial the days have proved to be for the children, siblings and parents alike.

Evaluation of Impact

Provision of the 'Lymphaletics' days has been extremely well received. Mixing with other children with similar problems has increased confidence to try new exercise/activities so helpful in managing lymphoedema and has generated a network of parent contacts enabling them to keep in touch and share experiences.

[37] CHRONIC LYMPHATIC SKIN ULCERS AND ACUTE LYMPHANGITIS

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[1] *LymphoLab, Italy*

In this paper, we will show you our specific experience about the early diagnosis and the proper treatment of the lymphatic aspects of the chronic leg ulcers.

Specifically, we will focus on the septic complication of chronic lymphostasis also known as lymphangitis. Very frequent complication in daily practice of Clinical Lymphologist.
As we know, the primary and secondary prevention of microbial infection is a first and fundamental step in reducing the recurrences of the septic complication in chronic lymphostasis like decreasing the risk factors. In any case, the number of these relapses is increasing today in the same way as the prevalence of lymphatic diseases in the world.

We have estimated almost 1 % of the patients who are accepted in the emergency room showing signs and symptoms related to the potential infection with primary involvement of lymphatic circulation.
The Lymphangitis Score can be used to recognise very early the high risk of infection overall in chronic patients with lymphiostasis.

Once the lymphatic involvement is suspected the therapy should have two principal approaches. First is the prescription of systemic antibiotics, broad spectrum or guided by clinical signs. The second approach is using the appropriate short stretch bandages of the limb with zinc oxide or new Manuka honey dressings to reduce the edema, improve the peripheral lymph flow and, in case of Manuka to keeping under control the bacterial local overload. In our presentation, we will show you both procedures which include the protocol for choosing an antibiotic and the correct pressure when applying the bandages.

Estimating correctly the lymphostasis and the lymphangitis complication are the most important things to help the patients with “non healing” chronic leg ulcers.

[38] KELOID/HYPERTROPHIC SCARRING: DO THEY IMPACT ON THE LYMPHATIC SYSTEM AND LYMPHOEDEMA RISK?

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Descriptions of the mechanisms involved in the pathogenesis of lymphoedema vary widely. A major cohort affected by lymphoedema are those who undergo breast cancer treatment with adjunct therapies. There is an estimated pooled incidence of almost 17% of unilateral arm lymphoedema in this cohort, with peak incidences occurring ~24 months' post-treatment/diagnosis. This could be attributed to an increase in mechanical occlusions or pulsatility restrictions of existing lymphatic vessels, due to aberrant fibrotic changes within, or extending from the wound.

Specific mechanisms for keloid scarring development are yet to be determined. However, pathogenetic features suggest that the immune system plays a pivotal role in keloid development, and perhaps, lymphatic transport. Currently, treatment for keloid scarring is limited. However, a 2015 study of 32 patients by Kawamura et al. noted that 24% of Asian patients receiving intra-operative radiotherapy for breast cancer developed hypertrophic scarring within a 5-year follow-up period, although no clinical lymphoedema was reported. They were unable to develop reliable predictors for scar development, but noted that tension was pivotal.

Thus, it is possible that lymphoedema may be caused by excessive deposition of fibrotic scar tissue, especially when cancer treatments include node removal and/or adjunct therapies, such as radiotherapy. It may be that fibrotic induration causes an alteration in the functional capacity of lymphatic vessels. Therefore, a focus on literature with respect to both lymphoedema and keloid/hypertrophic scarring, and the correlation between the two, is needed. Limited data/research is available at this time but will be presented at the meeting.

[39] REVERSAL OF STAGE 3 LYMPHEDEMA WITH WEIGHT LOSS: A CASE REPORT

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Purpose: Obesity is well known to be a risk factor for progression of lymphedema. When it reaches State 3, some literature suggests that it is "irreversible" and "unresponsive to treatment". This case report will visually demonstrate that the skin changes of Stage 3 lymphedema can be reversed with weight loss.

Case Description: A 41-year-old male was initially evaluated in the Mayo Lymphedema Clinic in May 2011. At that time, he weighed 284kgs (BMI=87.7) and had advanced Stage 3 skin changes of his legs, recurrent cellulitis, and malodorous lymphorrhea. His left leg was misshapen with deep soft tissue crevices, marked hyperkeratotic skin thickening, and superficial draining ulcerations. There was minimal improvement with Complete Decongestive Therapy (manual lymph drainage, compression bandaging, exercise, and skin care). On July 30, 2012 the patient had laparoscopic Roux-en-Y gastric bypass surgery. He subsequently lost more than 150kgs in the next year to 133kgs (BMI=41.1) and the measurements of his legs decreased markedly. The superficial skin ulcerations healed, the lymphorrhea resolved, recurrent cellulitis ceased, and the skin and soft tissues became more compliant.

Discussion: Stage 3 lymphedema (elephantiasis) is very challenging to treat by standard of care lymphedema treatment including CDT. This patient demonstrated that even advanced Stage 3 lymphedema can by reversed with weight loss in an obese individual. Therefore, recommendations for weight loss should not be neglected in overweight patients with lymphedema.

[40] THE EFFECT OF COMBINED THERAPY (MULTILAYER BANDAGE, RADIOFREQUENCY AND FREMS) IN POST-MASTECTOMY LYMPHEDEMA AND RADIATION THERAPY

Concetta Romano[1]

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Aims

The purpose of this review is to demonstrate the efficiency of multy-layer bandaging treatment combined with FREMS (Frequency Rhythmic Electrical Modulation System) for the reduction of the upper limbs edema and pain due to the long-term effects of mastectomy and radiation therapy.

Materials and methods

The state of art of lymphedema and neuropathic injury from mastectomy radiation therapy have been deeply investigated and revised. FREMS methodology has been used to analyze the impact of these treatments on microcirculation. The effects of combined therapy with multi-layer bandaging technique associated with radiofrequency and FREMS have also been evaluated.
Results. After a period of treatment (five weeks) with combined radio frequency therapy, multi-layer bandaging and FREMS a significant reduction of edema and pain caused by radiation damage has been appreciated. Surprisingly, these combined therapies are able to reduce or even suspend the assumption of painkillers and opioids.

Conclusion

Lymphedema is a usual complication affecting many women after breast cancer mastectomy treated with radiation therapy. The association of FREMS method with multi-layer bandaging and radio frequency seems to be helpful for these patients. More controlled, randomized, double-blind clinical trials are required/ should be performed in order to definitively validate the effectiveness of these combined therapies.

[41] MANUAL LYMPH DRAINAGE (MLD) AND COMPRESSION IN A WOUND CARE TREATMENT PLAN WITH PATIENT LIVING WITH LYMPHEDEMA - CASE STUDIES

Michel Eid[1]

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Introduction: Left untreated, lymphedema (L.E) not only causes tissue channels to increase in size and number, but also reduces oxygen availability in the transport system. L.E. can also interfere with wound healing at a cellular level by providing a culture medium for bacteria that can result in infection. Reduction of L.E. usually has a positive effect on wound healing, as it improves nutrient supply, lymphocytes and growth factors to the cells as well as the removal of degradation products. Moreover, it may help in cases of an infected wound by reducing the bacteria growth medium.

Objectives: To show the effectiveness of Manual Lymph Drainage (MLD) & short stretch compression bandages on wound healing in patients suffering of L.E.

Intervention: MLD and short stretch bandages 3-5 times per week, for 6 weeks and wound care dressing. Applied to a patient with lower limb wound lasting for 19 years suffering from lipo-phlebo-lymphedema, and to another patient following a post-mastectomy wound lasting for 6 months with trunk L.E.

Results: Clinically significant reduction of L.E., wound closure, reduction of pain as well as discontinued usage of antibiotics after 6 weeks of treatment, compared to the pre-treatment condition.

Conclusion: According to our clinical experience, sustained edema reduction is essential for preventing disruptions in chronic wound healing. Effective wound care in L.E. patients should include compression therapy & MLD. Further large scale comparative studies are necessary to assess the effect of MLD, compression & wound care versus wound care alone in L.E patients living with wounds.

[42] THE IMPORTANCE OF AN INTERDISCIPLINARY APPROACH OF PATIENTS WITH LIPEDEMA

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The Dutch multidisciplinary guideline "Lipedema" (Halke AB., Damstra RJ. 2014) in 2014 is a major step to improve the recognition of the diagnosis and the integrated treatment of lipedema.

Besides medical criteria, based on the ICF method, the guideline advises the use of a clinimetrical data set including functional and psycho-social parameters such as; circumference and volumetric measurements of the involved limbs, BMI, waist circumference, muscle strength, physical condition, daily activity level, psychosocial distress measurements and Quality of Life. These clinimetrics are used to initiate, tailor and evaluate the treatment program.

The treatment of lipedema is divided into conservative and surgical approach. The main targets of the conservative treatment are to (re-)gain a healthy lifestyle and to improve physical conditions. Treatment components are weight reduction and control (Esch-Schmeenge van J., 2016), graded activity training programs, optimization of the vascular/ lymphatic pump, edema reduction, pain relieve and other supportive measures, such as psychosocial therapy. Although weight reductions are achieved, the disproportional figuration of the body will not be resolved.
Super wet tumescent liposculpture reduces functional impairments, although this technic is not reimbursed (Schmeller, 2012).

Interesting single cases will be presented about the treatment results in the Dutch Expert Centre.

[43] LYMPHEDEMA ASSOCIATED WITH EVEROLIMUS IN A RENAL TRANSPLANT RECIPIENT: THE EFFICACY OF COMPLETE DECONGESTIVE THERAPY

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Lymphedema is an increasingly observed complication of rapamycin inhibitors, mostly due to sirolismus therapy. Herein we report a renal recipient with everolimus-induced lymphedema of upper extremity.
A 57-year-old white female who received a living-related kidney transplant 2.5 years ago, presented with left arm lymphedema since 5 months. Her immunsuppressive regimen consisted of high-dose everolismus (mean daily/dose:5.25mg)and corticosteroids. Venography and duplex ultrasound were normal. Lympangioscintigraphy revealed delayed lymphatic drainage in the left upper limb. She also underwent mamography and breast-ultrasonograpy to rule out breast cancer. She had grade2 lymphedema with Stemmer-sign positivity on the left arm and hand. The dose of everolismus was decreased and she received CDT comprising; skin-care-education, manual-lymphati- drainage, multilayer-bandaging and exercises for3 weeks-as a total of 15 sessions.

Results: The difference between right and left upper limb volumes and percentage of volumes were decreased significantly at the end of CDT phase 1 (1842 cm^3(R) and 2725 cm^3(L) vs 1818cm^3 (R) and 2196cm^3 (L), %47.9 vs %20.8). The DASH scores were assessed as 77.3 and 65, before and after treatments respectively. There was also significant improvement in quality-of-life(QoL) scores assessed by LymphQOL. The patient was prescribed a suitable pressure garment and continued self-massage and exercises after the discharge.

Conclusion: The early recognition of lymphedema as a side effect of everolimus therapy is important, in order to avoid the development of severe clinical complications. CDT for a duration of 3 weeks is effective in the improvement of lymphedema, functional status and QoL in patients suffering from this chronic condition.

[44] IDENTIFYING THE LYMPHATIC PATHWAYS AND PRESENTATION OF THE PIEZO1 MUTATION USING NIRF IMAGING

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Describe original / rare cases
PIEZO1 is a newly recognised gene responsible for generalised lymphatic dysplasia (GLD) and is a rare form of primary lymphoedema. It involves 4 limbs often with additional pulmonary and intestinal disturbances. A Patient was referred to the lymphatic mapping clinic to assist with treatment.

Aim Reason for report
NIRF lymphfluoroscopy, has advanced as a diagnostic and imaging tool in recent years. This technique provides the ability to identify lymphatic abnormality, individual lymphatic drainage pathways, functional lymphatics and map them accordingly. This case study will discuss the unique images and pathway seen following the imaging of this a patient with PIEZO1.

Cases(s) description
Following consent, patient received an intradermal injection of 0.1ml of ICG into the first interdigital web space of the worst foot and contralateral arm. Normal protocol was followed and deviated on as drainage was not as expected.

Discussion
This first mapping of PIEZO1 showed an unusual pathway to the arm via the non-anatomical pathway draining to the palm of the hand and arriving at the axilla. The appearance of the pathway was enlarged with wider vesssels. The leg, showed dermal backflow to the dorsum and planter sole and popliteal, consistent with lymphoscintigraphy. This case study will use video evidence to describe the particular pathways and possible adaptations to management to achieve better treatment outcomes. These pathways maybe unique to the patient with this gene mutation.

[45] POSTMASTECTOMY LYMPHEDEMA IS SUCCESSFULLY TREATED BY SILICONE TUBE IMPLANTATION BYPASSING THE AXILLARY PIT

Waldemar L Olszewski, Marzanna Zaleska

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Objectives: Women treated for breast cancer are facing a life-time risk of developing lymphedema in up to 40% of this population. In advanced cases of lymphedema main lymphatics are obstructed and tissue fluid accumulates in the interstitial spaces forming fluid “lakes”and “channels”. The only solution for fluid drainage would be creating artificial channel for flow away to the non-obstructed regions.

Aim. To form artificial pathways for edema fluid flow by subcutaneous implantation of silicone tubes bypassing armpit. Material and methods. Implantation was carried out in 35 patients with lymphedema after mastectomy, axillary lymphadenectomy and radiotherapy, stage II and III. Conservative treatment for at least 12 months remained without success. Tubes were placed from hand dorsum, through forearm and arm to scapular region. Implantation was followed by routine arm sleeve compression. Prophylactic long term penicillin was administered. The follow up is at present 24 months. External compression remained same as before implantion.

Results. a) implanted tubes brought about fast evacuation of excess tissue fluid, b) most decrease in circumference, volume and stiffness occurred in first two weeks, c) lymphoscintigraphy tracer accumulated in tubes and around them, e) free fluid was seen on ultrasonography at both ends of tubes and in between , e) no postoperative infection complications or tubing expulsion.

Conclusions. We propose a multimodality method comprising implantation, limb compression to generate fluid pressure gradient for flow and prevention of inflammation by administration of long-term penicillin. Operation is low-invasive and lasts 30minutes. It can be done in large cohorts of patients.

[46] OBSTRUCTIVE LYMPHEDEMA OF LOWER LIMBS CAN BE SUCCESSFULLY CONTROLLED BY SILICONE TUBE IMPLANTS REPLACING OBLITERATED LYMPHATICS-SIX-YEARS FOLLOW-UP

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Background. Obliteration of lymphatics recognized as lymphedema is followed by stasis of edema fluid with dilatation of intercellular space The question arouse whether decongestion of edematous tissue can be accomplished by implantation of artificial channels replacing function of lymphatics and support tissue fluid flow by application of external compression.

Aim. To follow effect of silicone tube implants replacing obliterated collecting lymphatics. Material and methods. Study included 60 patients with lymphedema of lower limbs stage III and IV. All patients developed edema after hysterectomy and radiotherapy with inflammatory episodes, 5 had infectious skin incidents in the past. Lymphoscintigraphy showed lack of flow of tracer from foot to the groin. Three medical grade hydrophobic silicone tubes o.d.3.2, i.d. 1.8 mm, perforated every 2 cm, were implanted subcutaneously from mid-calf to hypogastrium. Subcutis and node fragments were taken for on-plate bacteriology. Elastic stockings grade II and two weeks of intermittent pneumatic compression were applied postoperatively.

Results. After 3-6 years mean decrease in circumference in mid-calf was from 1.5 -5 cm (3-17%) and increase in elasticity by 7-23%. On lymphoscintigraphy tracer was seen in tubes or around them. On ultrasonography accumulation of fluid around tubes could be shown. In 4 cases inflammatory episodes at calf and hypogastric end of implant were observed. Retrospective analysis of bacteriology from time of implantation revealed presence of Proteus, Acinetobacter and Neisseria.

Conclusions. Silicone tube implants in lymphedematous is a low-invasive effective method for decompression of obstructive lymphedema. Bacteriology of deep tissues at time of implantation is helpful for controlling infective inflammation episodes with specific antibiotics.

[47] "THE MONKEY ON YOUR SHOULDER": A QUALITATIVE STUDY OF LYMPHOEDEMA PATIENTS' ATTITUDES TO AND EXPERIENCES OF ACUPUNCTURE AND MOXIBUSTION

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Background: Lymphoedema has significant negative impact on health-related quality of life. Multi-disciplinary approaches are needed to improve physical and psychosocial wellbeing. Acupuncture and moxibustion (acu/moxa), two modalities of traditional East Asian medicine, may contribute to improved outcomes for cancer survivors with lymphoedema.

Aims: To explore how patients with lymphoedema secondary to cancer treatment perceive and experience acu/moxa treatment.

Methods: A qualitative focus group study, nested in a 3-step mixed methods observational study, was approved by a National Institute of Health Research (NIHR) Regional Ethics Committee, and carried out in a cancer centre in collaboration with the lymphoedema service. Six focus groups and one telephone interview were conducted with 23 breast or head and neck cancer survivors who had completed up to 13 acu/moxa treatments. Scripts were transcribed, coded, and analysed to identify salient and overarching themes.

Results: Participants described feeling disempowered by cancer treatment and consequent lymphoedema. Acu/moxa was valued for its whole-person approach. Participants described changes in physical and psychosocial health (including increased energy levels, reduced pain and discomfort, and alleviation of lymphoedema-related symptoms) and reported feelings of empowerment, personal control, and acceptance. Many were motivated to improve self-care.

Conclusion: This study is the first to report lymphoedema patients' experiences of acu/moxa, and includes head and neck cancer patients, an under-researched group. Building on this data, the authors propose a model that illustrates the potential for acu/moxa to facilitate change through reducing symptom burden and improving energy, leading to consequent positive impacts on motivation, self-care, and long-term wellbeing.

[48] COMMUNITY BASED LYMPHOEDEMA CARE IN A FILARIA ENDEMIC AREA - THE SITAPUR MODEL

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Introduction: SATHI a registered not for profit offering healthcare solutions to remote communities partnered with SANGTIN a community based NGO to create a replicable model of Lymphoedema care in communities with high endemicity for Filariasis

Objectives: To develop a self-sustained a community level care model in a rural, remote and resource poor area.

Materials & Methods: A 3-day camp was organized with the following components:
Training and general advice about the disease to local volunteers
General assessment, Patients classified from Gr 0 to III
General skin hygiene and washing and Penicillin (all)
(Gr II & III) standard kit consisting of Stockinet + padding + short stretch bandages with demonstration on how to tie, managing and reporting, emergency measures, exercizes and washing instructions.
Monthly followup visits as well as home visits were done by local volunteers and monitored online by SATHI.
Data collection was related to volume decrease as well as ADLA, general compliance

Results: 33 patients in Gr II/ III. Volume measurements next 2 days revealed an average 40% reduction which increased to 69% during follow up over the next two months. (significant for both) - immediate as well as three month measurements. There were no complications or even ADL attacks during this follow up period. Only complaint was less or no response of swelling of the foot and toes. Follow up (13 months) showed sustenance.

Conclusion: A modeled camp based approach is offered through suitably trained health workers

[49] FIRST DUTCH GUIDELINE ON LIPEDEMA USING THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF)

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Lipedema is a chronic, progressive condition that can result in considerable disability. The diagnosis of lipedema has not yet been registered in the ICD-10 and the pathophysiological mechanism is not clarified. Often the clinical picture with disproportional fat distribution and complains indicate the diagnosis, although the phenotype is more often seen in certain regions of the world without being diagnosed as lipedema. In 2011, the Dutch Society of Dermatology organized a multidisciplinary task force, including patient societies, to create guidelines on lipedema with a more functional approach, using the International Classification of Functioning, Disability and Health of the WHO.

The guidelines define criteria to make a medical diagnosis of lipedema, a data set of clinical measurements that should be used to ensure early detection and an individually outlined follow-up plan, pillars on which conservative treatment should be based and recommendations on surgical treatment options.
Little consistent information concerning either diagnostics or therapy can be found in the literature. Lipedema is frequently misdiagnosed or wrongly diagnosed as lymphedema, obesity, generalized Dercum disease or an aesthetic problem and vice versa. Treatment is divided into conservative and chirurgic treatment by removing the abnormal adipose tissue. The guidelines give tools for a rational and functional approach for the diagnosis and treatment of lipedema.

[50] A PROJECT PARTNERSHIP BETWEEN HEALTHCARE WORKERS IN SIERRA LEONE & WALES TO IMPROVE OUTCOMES FOR BREAST CANCER PATIENTS

Elizabeth Coveney[1]

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Aims: A cancer centre in Wales (Velindre) want to partner with their colleagues in Sierra Leone to improve outcomes for patients with breast cancer.

Description: Wales for Africa board (linked with Welsh Government) encourages links with African nations. Under this board, Velindre Cancer Centre has partnered with a team of healthcare workers in Sierra Leone to improve cancer patient outcomes. Local workers identified breast cancer for improvement. Patients present late with breast cancer, many already having fungating breasts and lymphoedematous arms. The Welsh team initially consisted of breast surgeons, oncologists and breast care nurses. Teaching has been given to healthcare workers. Previous visits identified lymphoedema an area for improvement. A lymphoedema specialist visited alongside the team, teaching women themselves how to do some simple bandaging to give support to the limb. Materials brought were those suitable for wash and re-use so that each woman could re-bandage herself as she found helpful. Patients were also taught Simple Lymphatic Drainage techniques with the use of posters and handouts using diagrams.
Health care workers had education sessions on lymphoedema to raise awareness and some simple techniques taught to support the women with lymphoedema.

Outcome: On this first visit a small number of people have been helped. As this is the first time lymphoedema has been considered, assessment of need has been carried out. Best ways in which to support in future will be established.

Evaluation of impact: Surgical and oncology team have seen improvements in post mastectomy recovery. Evaluation of lymphoedema is ongoing.

[51] THE OCCLUSION PRESSURE OF THE SUPERFICIAL LYMPHATIC NETWORK IN THE LOWER LIMB OF PATIENTS WITH FUNCTIONAL LYMPH COLLECTORS

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Introduction Recently we showed, thanks to Near-Infrared Fluoroscopy, that the superficial lymphatic occlusion pressure in the upper limb of 32 healthy volunteers ranged between 80-140 mm Hg, mean 88.75 (SD 14.76). Given the surprising results, we decided to adapt the protocol on lower limb of patients with functional superficial lymph collectors in order to determine the superficial lymphatic occlusion pressure in the lower limb. Here we present our preliminary results.

Methods Near-infrared fluoroscopy was performed on the lower limb in 16 patients with venous impairment or lipedema, but functional lymph collectors. Lymph flow was observed above a sphygmomanometer cuff, inflated by steps of 10mmHg. Optimized manual lymphatic drainage was executed during experiment to fill the observed lymphatic collectors, making sure they were stocked with lymph. Lymphatic pressure was established when lymph flow stopped. The experiment was interrupted at 160 mmHg, even if the lymph flow was still passing under such a high pressure.

Results For one patient, the occlusion pressure was 130 mmHg. For the other 15 patients, lymph flow was not stopped at 160 mmHg. Lymphatic occlusion pressure is then higher than 160 mmHg for most of the subjects.

Conclusions Near infrared fluoroscopy combined with optimized manual lymphatic drainage is an efficient tool to determine the lymphatic occlusion pressure of the superficial lymphatic collectors. Our study pointed out that the occlusion pressure of healthy superficial lymphatic collectors in the lower limb seems to be much higher than previously described, and even higher than in the upper limb.

[52] IDENTIFICATION OF INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH CATEGORIES IN LYMPHOEDEMA PATIENTS IN SOUTH AUSTRALIA

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Background: The International Classification of Functioning, Disability and Health (ICF) is a World Health Organisation (WHO) initiative that assists in describing health and disability at both the individual and population level. Core sets of ICF classifications assists health care professionals to ask targeted questions to determine the factors in a patient's life that are most likely to be influenced by that disease. A cross-sectional survey was performed as part of the development of ICF core sets for lymphoedema.

Objective: To determine the most common factors and activities of daily living that are affected in individuals with lymphoedema in South Australia.
Methods: Participants were recruited from the Lymphoedema Research Unit database at Flinders University South Australia. The participants completed three self-administered questionnaires about their health and quality of life. One face to face semi-structured interview focussed on their body functions and structures, activity and participation limitations and environmental factors, as well as their socio-demographic status.
Results: Hundred forty-nine participants were included. Most mentioned limitations are in the area of activity and participation and changes in body function and structure of the affected area. The location of lymphoedema affects the impact of the condition on the quality of the lives of the participants.
Conclusion: ICF core sets for lymphoedema will help researchers and health professionals understand to what extend lymphoedema is affecting the patient. It will also help to gain more recognition for lymphoedema as a significant condition by a wider community of health care providers.

[53] CHRONIC LOWER LIMB OEDEMA IN LONG-TERM CARE POPULATIONS: PREVENTION AND TREATMENT CHALLENGES

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Introduction: There has been little published on chronic edema in long-term care settings. Based on the authors' clinical observations in four Canadian long- term care institutions in Quebec and in Manitoba, we estimate that multifactorial chronic edema is present in 35-40% of residents. Health care personnel in these institutions are not provided the appropriate education to prevent, assess and treat chronic lower limb edema. Preliminary observations suggest that chronic edema may contribute to mobility issues, falls, and may lead to further complications such as wounds and lymphorrhea. However, the cellulitis rate might be less than in the non-institutionalized elderly.

Description: The aim of this exploratory, interactive presentation is to initiate a dialogue amongst lymphedema professionals about ways to encourage research that could address some of the following questions: 1. What is the prevalence of chronic edema in long-term care institutions? Are there differences between regions, and between private and public institutions? 2. Is the morbidity (particularly cellulitis) the same among institutionalized patients as among those living in the community with chronic edema? 3. What specific treatment modalities are used? 4. What are the funding challenges in this population? 5. What educational and research initiatives might improve the standard of care in the institutionalized elderly?

Implications: Lymphedema professionals may be stimulated to become more active in the prevention and improved treatment of chronic edema in long-term care settings.

Conclusion: The opportunity for dialogue afforded by this conference may encourage future research on chronic edema in long-term care institutions.

[54] THE CONCEPT OF POSITIVE HEALTH

Irene Zonderland[1]

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Due to developments and changes in healthcare since 1948 (WHO definition of health), a new concept of Health has been introduced in 2012: “Health as the ability to adapt and to self-manage, in the face of social, physical and emotional challenges”,
The new concept focuses on a patient centred approach instead of focusing on the disease.

This concept distinguishes itself by the use of a broad perception of health with six dimensions: body functions, mental functions, spiritual dimension, quality of life, social participation and daily functioning.
People acknowledge the new concept, as it addresses individuals being more than their illness and emphasises people’s strength rather than their weaknesses.

By visualising the six dimensions on a subjective scale in a web diagram, it is possible to indicate a person’s health surface, also called ‘Positive Health’. This can be used as a conversation tool to support patients to amplify health by making their own choices towards important elements concerning their life.

This tool differs from other biomedical and illness related questionnaires because of the wide applicability, regardless the illness. Furthermore, it is easily accessible. As the tool is developed and tested in the Netherlands, the use of the tool in other populations should be further researched.
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BMJ Open 2016; 5:e010091. Doi:10.1136/bmjopen-2015-010091

www.ipositivehealth.com/scoringsinstrument-voor-positieve-gezondheid

www.mijnpositievegezondheid.nl/#/

[55] EXPERIENCE POSITIVE HEALTH (WORKSHOP)

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During this workshop, we will take you along the different aspects of Positive Health.
The new concept of health focuses on a patient centred approach and the individual capacity to adapt and to cope with new situations. This concept distinguishes itself from the traditional vision on health of the WHO (1948) by the use of a broad perception of health with six dimensions: body functions, mental functions, spiritual/existential dimension, quality of life, social participation and daily functioning.

Self-management, being one of the main topics in lymphedema care in the last decade is fully embraced in this new definition.
You are going to judge your own health, according the new six dimensions and create your own 'health surface'. What do you want to change or improve? And what do you need to succeed?

Motivational Interviewing (MI) is a way of helping people change.

The spirit of MI is:
Partnership – be a team
Trust and acceptance
Client centered
Leading and guiding
Activating own motivation and resources

You will learn about MI and self-management.

References

Huber M, van Vliet M, Giezenberg M, et al.
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[56] ICF CORE SETS: A NEW WAY OF STATUS-REPORTING FOR THE LYMPHEDEMA PATIENT

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Introduction: For understanding the challenges of patients with lymphedema it is important to describe functioning and to measure the effectiveness of treatment in changing functioning. The International Classification of Functioning, Disability and Health (ICF) offers an international framework to classify functioning of persons in their personal environment. ICF Core Sets are lists of selected ICF categories concerning those important aspects of functioning that are most likely to be affected by a specific health problem or disease. These Core Sets make it easier and faster to describe and communicate the patient's problems and to define treatment goals. Furthermore, they are available to health care providers of all professions, researchers, health insurance companies and policy-makers.

Description: In this presentation a new way of reporting the functional status of the lymphedema patient will be shown. ICF Core Sets can be a guideline in the clinical reasoning to come to treatment goals and monitor the treatment process.

Implications: By means of an electronic tool (e-tool), standardized data of patients' functioning and environmental factors can be systematically collected and token in at a glance.

Recommendations: Existing electronic patient files should be remodeled including the ICF Core Sets for lymphedema.

[57] NEW EUROPEAN REFERENCE NETWORK FOR PEDIATRIC AND PRIMARY LYMPHEDEMA

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The European committee started in 2015 a project to develop 21 European Reference Networks (ERN) of rare diseases. ERNs gathering the best EU experts on Rare Diseases to face the challenges of rarity, benefit from EU cooperation, represent a home for every Rare Diseases Patient in Europe. To become an ERN, at least 10 healthcare providers from nationally recognized centres of expertise of highly specialized healthcare from at least 8 EU countries are present. One of the ERN's is on rare multisystemic vascular diseases, which consists of 6 working groups. One of them is the Working group on pediatric- and primary lymphedema (PPL-WG) with members from United Kingdom, France, Netherlands, Germany, Belgium and Finland. New centers are invited to join us.

Our VASCERN project aims to facilitate and improve:
Institutionalize EU experts' cooperation
Develop concrete projects such as on communication, telemedicine, teaching, research, information dissemination, patient empowerment and evaluation
Overcome the challenges of rarity
Facilitate access to diagnosis and treatment in rare or low prevalence complex diseases or conditions
Centralizing ad bring together knowledge, experience, medical research, training, resources, promote best practices
Reduce inequalities of treatment and enhance access of care for patient within the EU

Reference:
www.ernvascular.eu

[58] ON THE GROUND EDUCATION PROGRAMME AND THE DEVELOPMENT OF THE "CHRONIC OEDEMA WET LEG PATHWAY"

Karen Morgan[1], Melanie Thomas [2]

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Introduction: The 'On the Ground Education' Programme commenced 2016 following funding from Welsh Government Efficiency through Technology fund.
The aim of the programme was to deliver education directly to community nurses within their day to day workload, incorporating video prescriptions and Agored accredited work based education. Assessing and treating patients instantly, improving the current management of chronic oedema as well as significantly improving efficiency of prescribed dressings, bandages and compression garments.

Rationale: Lymphoedema Network Wales (LNW) offers accredited education regarding the management of Lymphoedema and chronic oedema but has had limited uptake from community nurses due to non-release by managers for education and training. Many patients are ineffectively managed with dressing pads and yellow line, creating the need for frequent nurse calls.

Description and Evaluation: The programme quickly identified confusion on the ground amongst nurses regarding the management of patients with leaking legs and oedema. Development of the "Chronic Oedema Wet Leg Pathway" empowers nurses to effectively manage these patients. Working with nurses raised awareness of chronic oedema, early identification of patients and enabled prompt management promoting better health for patients. Empowering discussion, reflection and learning has influenced change in practice which is supported through the focus group research.
Unratified data demonstrates a significant reduction in nurse visits of 69%, a reduction in cellulitis episodes and spend on dressings.
Overall Quality of Life for has improved by 22%, mobility improved by 16%, self-care improved by 24%, usual activities improved by 22%, pain/discomfort improved by 29% and anxiety/depression improved by 17%.

[59] PROFESSIONAL EDUCATION ON BREAST-CANCER-RELATED LYMPHOEDEMA AND ITS RELATION TO PATIENT WELL-BEING

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The most common cancer diagnosed in the UK is breast cancer, which is the most common cancer among women (Deo et al, 2004). The risks of developing lymphoedema are greater when both surgery and radiotherapy are used; there is a higher incidence of lymphoedema in these patients (Gilbert and Mortimer, 2001). Breast-cancer-related lymphoedema (BCRL) is a
chronic progressive condition and is the precursor to a lifetime of on-going management and attention, which can be disruptive to daily living and activities (Harmer, 2009). An important part of the care of breast cancer survivors is the provision of advice on precautions and lifestyle modification to reduce the lifelong risk of developing BCRL
(Nielsen et al, 2008). Patients' ability to manage and cope with their illness depends on their understanding of the experience (Johnson et al, 1997). Healthcare professionals (HCPs) should provide breast cancer patients with both written and oral information at every follow-up appointment to help reduce the risk of developing lymphoedema. The purpose of this systematic review was to explore whether knowledge about BCRL is adequate among patients and whether HCPs are assisting in reducing the risks of developing this condition.

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[60] THE IMPACT OF LYMPHOEDEMA RISK REDUCING RECOMMENDATIONS ON PEOPLE TREATED FOR BREAST CANCER

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Introduction: Within my doctoral studies, I chose to qualitatively investigate the impact of ***Lymphoedema Risk Reducing Recommendations*** (LRRR) to people affected by breast cancer. The impact of lymphoedema causes physical, psychological and social problems (Ridner, 2005; Fu & Rosedale, 2009). However, the impact of following LRRR is limited. A literature review and clinical experience suggests much confusion exists.

Aims of the Study: Gain understanding from people treated for breast cancer of the experiences and impact that following the LRRR cause to daily life, in order to better inform clinical practice.

Methods: Focus groups were chosen as a method to gain a collection of voices, experiences and stories. After full local ethical approval, purposive sampling occurred within a local lymphoedema service. Data was analysed using ***Narrative Analysis*** and A***nalysis of Narratives*** (Polkinghorne, 1995***)*** supported by transition theory (van Geneep, 1969).

Results: Thirty breast cancer survivors were recruited and a total of six focus groups occurred (3-8 participants). Considerable, ***physical, psychological and social adjustments/alterations*** to daily life occurred following LRRR. Other themes included '***living with fear', 'losing and gaining control', 'It's Normal but it's a New Normal'*** as well as '***Hope and Helping others'***. The most dominant theme though was one of '***Confusion and Uncertainty'.***

Conclusions: It is critically important for clinicians to be aware of the implications that occur in following the LRRR. Significantly, liminality occurred from confusion caused by uncertainty from clinicians. Changes need to occur within health care to ensure people are only given evidenced based recommendations.

[61] THE ASSESSMENT OF BREAST CANCER RELATED BREAST AND CHEST WALL LYMPHOEDEMA

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[2]*University of Nottingham, United Kingdom*

Introduction: It has been recognised that patients undergoing treatment for breast cancer are at risk of developing lymphoedema of the arm (BCRL). Lymphoedema can also affect the breast or chest wall after breast cancer treatment but this area of BCRL does not appear to be as well studied. Although mid-line lymphoedema is recognised in the clinical setting the assessment, the techniques used to monitor treatment effects are often subjective and differ between clinics.

Aims: The aim of the systematic search and review was to examine the available literature on the assessment and development of mid-line lymphoedema following treatment for breast cancer, including evaluation of the assessment techniques available.

Methods: A systematic search of online search databases was undertaken. These included Ovid, PubMed, Medline and the Cochrane Library.

Results: The review identified 180 papers, of which 29 focused on mid-line lymphoedema.
The incidence of breast oedema was reported in 10 studies and ranged from 9.6% to 62.6%. The range in incidence reported in these papers reflects the different study methodologies including the sample size, objective and subjective assessment tools, frequency and duration of assessments.
Several objective assessment techniques were identified. These are commonly used to assess arm lymphoedema and had been adapted for mid-line lymphoedema.

Conclusion: The review ascertains why there currently isn't a gold standard tool for the assessment of mid-line lymphoedema. Further research needs to be undertaken to validate these tools and to develop normal and abnormal ranges to define the presence of mid-line lymphoedema.

[62] COMPARISON OF THE EFFICACY OF DIFFERENT BANDAGING METHODS IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA: PRELIMINARY REPORT

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Background and aims: Upper extremity lymphedema is a concerning complication occurred after treatment for breast cancer. The aim of this study was to evaluate the comparative efficacy of a new 3M Coban 2 system bandaging and conventional multi-layer short-stretch bandaging, in regard to volume reduction, ultrasonograhic measurements, functional status and quality of life in patients with BCRL.

Methods: A randomized, prospective single-blind study was performed with 50 patients suffering from BCRL. Patients were randomly allocated to Group 1 (skin care, MLD, traditional multi-layer short-stretch bandaging five times per week, and lymphedema exercises) or to Group 2 (skin care, MLD and 3M-Coban 2 system, which was applied two times per week for 3 weeks and lymphedema exercises). The difference in volumes, excess volumes, ultrasonographic measurements, quality of life and functional assessment scores were evaluated at baseline and after three weeks in all patients.

Results:. There were significant improvements in volumes, excess volumes, ultrasonographic measures, functional scores and QoL scores in both groups, at the end of therapies.

Conclusions: In conclusion Coban 2 layer bandaging performed as a part of CDT twice a week, for 3 weeks, can greatly reduce the volume as well as improve the disability and impaired QoL, similiar to conventional short-stretch multi-layer bandages applied as a part of CDT. In addition, treatment with the 3M Coban 2 system was enabled time consuming, easy and comfortable application of bandaging with increased mobility of the upper extremity.

[63] CLINICAL AWARENESS AND KNOWLEDGE OF BREAST CANCER RELATED LYMPHEDEMA AMONG A GROUP FAMILY PHYSICIANS IN TURKEY - AN ONLINE SURVEY (PRELIMINARY DATA)

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Background/purpose: The aim of this study was to determine the awareness and knowledge of Breast Cancer Related Lymphedema(BCRL) among a group of family physicians regarding its causes,symptoms,treatment and management in a region of Turkey.

Methods: The participants were asked to answer a 10-minute web-survey, including 20 questions.In addition to their demographical and logistic properties, the questionnaire elicited data on knowledge,education and awareness of the family physicians on diagnosis and treatment of BCRL.

Results:Thirty-two female and 21 male family physicians from Ankara region completed the survey. 38% of participants were aged between 41-50 years and 36% of participants had worked at family health centres. Seventy percent of the physicians reported that they have heard but very limited knowledge about lymphedema. 60% of the participants had low level of knowledge on current scientific literature about the factors that predispose BCRL development.90% of the participants had not attended any conference, workshop, or other educational events related BCRL or lymphedema generally in the past 5 years. Fifty-seven percent of the subjects had heard about manual lymphatic drainage (MLD) and 57% about multilayer lymphedema bandaging and 51% about compression garments.96% of them had no information about reports of International Lymphedema Framework. 53% and 41% of the participants reported that they would forward the patients to vascular surgeon and physiatrists.

Conclusion: The awareness and education about lymphedema are low among Turkish family physicians. Comprehensive education programmes about lymphedema is very important for postgraduate medical education in Turkey,in order to increase awareness and quality of care in patients with BCRL.

[64] INVESTIGATING KNOWLEDGE AND VIEWS OF LYMPHOEDEMA HEALTHCARE PROFESSIONALS IN REDUCING THE RISK OF LYMPHOEDEMA IN PEOPLE TREATED FOR BREAST CANCER

Melanie Thomas[1]

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Introduction As part of my Doctorate exploring the impact of Lymphoedema Risk Reducing Recommendations (LRRR) on people treated for cancer, I sought to investigate the knowledge and views of Lymphoedema Healthcare Professionals (LHCP). Based on a literature review the current LRRR advice and information provided to people treated for breast cancer is ambiguous with no standardisation.

Aim The aim of this study was investigate the knowledge and views of LHCP on the LRRR and ascertain what information are LHCP providing to people treated for breast cancer?

Methods Pragmatically, a survey was developed based on a literature review and results from a qualitative study investigating the impact of LRRR on people treated for breast cancer. Following ethical approval, I purposely sampled LHCP through advertisements in the British Lymphology Society Newsletter, Twitter and direct emails to chairs of lymphoedema groups/clinical leads. Snowball sampling occurred.

Results 140 questionnaires were returned (48post/92email). 135/140 questionnaires were accepted. A variety of disciplines replied including physios, nurses, doctors and others. 82% from the UK,18% International. The strongest likert scale agreement were: 100% treat fungal infections, 99% wear gardening gloves/protect skin from cuts, 97% exercise daily, 96% moisturise daily,92% reduce BMI <25, 90% no injections or tattoos,86% no blood pressure,67% avoid tight jewellery, 67% avoid extreme temperature,61% no sauna,58% don't carry bag/push or pulling activities.

Conclusions Surprisingly, many responses were not evidenced based and included suggestions of avoidance of normal activities. Confusion and uncertainty was evident with only 28% providing the three evidenced based LRRR information.

[65] PROPRIOCEPTION SENSE IN LYMPHEDEMA AFFECTED UPPER LIMB

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Introduction: The term Kinesthesia, is used to refer to sensations of limb position and movement. The difference between what is expected and the actual position and movement of the limb occurs through a feedback. The study of proprioception in lymphedema, where we are aware that it is impaired, has been very little investigated.
Aim of the Study: The study has thus the aim of providing prove of the affected proprioception in lymphedema affected limbs.

Methods: Blindfolded subjects sat at a table with their forearms positioned on paddles. The hinges of the paddles were aligned with the elbow joint and had electronic goniometer to measure the angle in positioning the forearm. Paddles could be moved by an electric servomotor with a slow angular speed that could be hardly appreciated by the muscle spindles. Subjects have to guess the position of the affected arm, in comparison with the other one, studying the position sense of the lymphedema affected arm.

Results: The study investigated 50 women affected by upper limb secondary lymphedema, measuring, besides the difference in terms of degrees of arch of movement in comparison with the unaffected arm, also the duration of lymphedema and the circumference of the forearm.
The results are matched with a control group of 50 unaffected women, providing prove of compromised proprioception in lymphedema affected arms, depending more, as the data show, on the duration of lymphedema than on the size of the lymphedematous arm.

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Poster Abstracts

[1] COMPRESSION CORSETS IN PHYSIOTHERAPEUTIC TREATMENT OF PATIENTS AFTER AXILLARY DISSECTION

Rita Hansdorfer-Korzon[1] , Jacek Teodorczyk[1] , Agnieszka Gruszecka[1] , Piotr Lass[1]

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Introduction: There is no fully effective treatment for secondary lymphedema. In patients with breast cancer, lymphedema may present immediately after axillary dissection or later. It typically occurs in a limb (such as an arm), but it can also occur in the torso, especially in breast cancer patients. It is, therefore, essential to prevent or minimize the condition. The currently used compression therapy has varying efficiency. Thus, researchers are still looking for better solutions, especially for primary prevention.

Aims: The aim was to find whether compression corsets therapy could prevent truncal lymphedema on the operated side after axillary lymph node dissection as the standard for breast cancer treatment and whether this therapy is efficient in prevention and treatment of truncal lymphedema in patients who underwent mastectomy and additional radiotherapy.

Methods: The study was carried out in 50 randomly selected breast cancer patients classified by the oncologist as candidates for surgery. The study group was randomly divided into two subgroups: subgroup G (received compression corsets 1 month following the surgery) and subgroup K (control) no physiotherapeutic treatment. The size of truncal lymphedema was measured using ultrasound. The patients were examined four times. The follow-up was for 7 months in total. The results were statistically analyzed. Also in both subgroups, we analyzed the reduction of pain.

Results: class I compression corsets are an effective treatment for lymphedema, could be used for antiedematous prevention in patients who underwent removal of axillary lymph nodes and radiotherapy and also could reduce pain associated with surgical treatment of breast cancer.

[2] MANAGEMENT OF VENOUS EDEMA AND LYMPHEDEMA BY GENERAL PRACTITIONERS

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Introduction: Chronic venous insufficiency (CVI) is a common cause of secondary lymphedema. The appropriate management of leg swelling provided by primary care is important.

Aims: To evaluate the management of edema and lymphedema in CVI provided by general practitioners (GPs).

Methods: The 2-center cross-sectional study involved 445 patients with the presence of the edema of the legs diagnosed and treated by GPs during a one-month period. The serious edema of the lymphedema type was noted in 1.6% patients. Demographic and clinical data were obtained by physical examinations and standardized interviews.

Results: The GPs' management of patients with edema and lymphedema of the legs according to gender and age showed virtually no gender or age-related differences. The management of patients included different types of treatment; venoactive drugs were recommended to 91.5%, lifestyle advice to 89% and compression therapy included bandages and stockings to 52.8% of patients. The other types of treatment such as physical therapy, topical therapy or exercises were prescribed to 7.4% patients. Dual and triple combination therapies were the most frequently recommended types of treatment. More than half of patients were referred to a vein specialist.

Conclusions: Despite GPs had undergone a course in phlebology before they were included in the study, patients did not receive complete management of their condition such as compression and physical therapy whether they had edema or lymphedema. Continuous training of GPs and clinical guidelines for the management of peripheral edema may help GPs to make adequate decisions.

[3] EFFECTS OF COMPLEX DECONGESTIVE THERAPY ON QUALITY OF LIFE, DEPRESSION, NEUROPATHIC PAIN AND FATIGUE IN PATIENTS WITH BREAST CANCER RELATED LYMPHEDEMA

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Introduction: Lymphedema, a significant health issue, can severely affect patients' quality of life.

Aims: To investigate the effects of complex decongestive therapy (CDT) on quality of life, depression, neuropathic pain, and fatigue in patients with breast cancer related lymphedema (BCRL)

Methods: 60 patients with BCRL were assigned for the study. Demographic data and previous medical records were recruited from medical files. Besides, surveys such as European Organization for Research and Treatment of Cancer Core-30 (EORTC- Q30) for quality of life, Brief Fatigue Inventory (BFI) for fatigue, Douler Neuropathic 4 Question (DN4) for neuropathic pain and Beck Depression Inventory (BDI) for emotional status were carried out before and after the treatment. All patients had 20 sessions (1 hour) of CDT for 4 weeks (5 days per week). Comparisons of pre- versus post-intervention values for continuous variables were made using paired t- test. A p-value of less than 0.05 was considered significant. The local ethics committee of our University approved this study (16-5/9).

Results: We determined a statistically significant reduction in the volume of the involved limbs after the treatment ($p< 0.001$). Our results suggest a significant reduction in general health and functional scales of EORTC Q30 ($p< 0.001$, $p= 0.004$ respectively). DN4, BFI and BDI scores of the patients were significantly improved after the treatment ($p< 0.001$, $p= 0.043$, $p= 0.019$ respectively).

Conclusion: CDT is an effective method to achieve not only a significant volume reduction in limbs, but also good outcomes in management of other symptoms related to BCRL .

[4] IS THERE ANY SUPERIORITY? COMPARISON OF FOUR DIFFERENT THERAPY PROTOCOLS ON EXTREMITY VOLUME IN BREAST CANCER RELATED LYMPHEDEMA

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Introduction: Since lymphedema is a disorder which is both chronic and persistive, there is still need to determine the comparative benefits of the different therapies for this condition.

Aims: To compare the responses of different therapy protocols on extremity volume in patients with breast cancer related lymphedema (BCRL).

Methods: 117 patients with BCRL were selected for the study. The patients were treated with complex decongestive therapy (CDT) (n:25) in- Group 1, with CDT + pneumatic compression therapy (PCT) (n:25) in- Group 2, with CDT + PCT+ low intensity laser therapy (LLT) (n:45) in-Group 3, and with PCT+ LLT (n:22) in-Group 4. The differences between the treatment methods with Kruskal-Wallis test, and Pearson Chi-Square test. The local ethics committee of our University approved this study (Decision number: 16-7/2).

Results: Our analysis within groups suggested statistically significant reduction in the average volume of the upper limbs in nearly all the groups (group 1, 2, 3) (p=0.001) except group 4 (p=0.592). Besides, the results of post-hoc analysis between groups demonstrated a significant difference by means of delta limb volume (p=0.000). We noted that PCT+LLT group caused the statistical difference. The delta values in this group were significantly lower compared to other groups.

Conclusion: We observed that CDT alone and the PCT and LLT in combination with CDT were effective in lymphedema treatment. However, since the PCT and LLT result in significant volume reduction only when they are used in combination with CDT, we cannot conclude that they are effective treatments when used alone.

[5] BRAIN HYPER-LYMPHATIC HIGHWAY NETWORK

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Our purpose is to discuss the role of lymphatic system in the complex mechanism that regulates volume in the fetus and new born, while placing special emphasis on the role the lymphatic system plays in mediating and maintaining this distribution, both during the fetal life, and during the changes occurring in the new born at birth.

We focus special attention on relationship between lymphatics and brain. Although scientists have believed for years that the cerebrospinal fluid (CSF) acts as the brain's highly refined lymphatic system, two statements are traditionally very difficult to tie together: there are no lymphatic vessels in the brain parenchyma and there is a highly specialized system that allows the CSF to move into the brain, thus exchanging with fluid inside the brain.

We try to assess whether early cervical lymphatic obstruction is associated with a sonographically detectable dilatation of the ventricular system in the 1st trimester of pregnancy, and, in particular, to assess whether foetuses with NIHF, cystic hygroma or enlarged nuchal translucency are at risk to develop early signs possibly linked to congenital lymphatic dysplasia.

We would like to discuss briefly what is now known in this fascinating field, then concluding that CSF runs into the brain just like since a long time scientists thinked indeed, but that an incredible advanced network of anatomical structures, we can define it as a sort of marvellous and hyper-developed brain lymphatic system, a "brain hyper-lymphatic highway network", allows CSF circulation and brain cellular waste filtering.

[6] COMBINED CIRCUMFERENCE METHOD WITH DIELECTRIC MEASURE IN LYMPHEDEMA DIAGNOSIS: AN OBSERVATIONAL PILOT STUDY

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Introduction: Upper limb lymphedema is physical-functional chronic complication that impacts the quality of life of women who have gone surgical treatment for breast cancer. An early diagnosis of lymphedema could help therapists to start an early treatment program but nowadays this assessment is hard to be achieved.

Aims: Compared the circumference method for the quantitative measurement of lymphedema and the evaluation of local tissue water via tissue dielectric constant (TDC).

Methods: An observational pilot study has been designed to assess, in a two years' follow-up, the presence of lymphedema in a group of 16 women who have undergone axillary dissection. Circumference measurements have been accomplished by measuring both upper limbs circumference with a tape measure every 4cm with a 2 cm differences considered as a positive sign of lymphedema. TDC measurements have been accomplished using Delfin MoistureMeterD Compact in 4 standardized points with any difference over 30% of ratio between both arms considered as a possible lymphedema.

Results: Data obtained from circumference measure suggest a lymphedema diagnosis in 4 patients (25%). This number raised to 6 (37%) by using data from TDC measurements.

Conclusion: Our preliminary results suggested that the use of TDC could be more sensible to detect under skin liquid abnormality that could lead to a pre-clinical signs of lymphedema. Remains the question whether these patients will develop arm's swelling. Combining circumference measure, TDC and lympho-fluoroscopy could lead to a more precise and an early stage lymphatic alteration diagnose.

[7] A COMPARATIVE PILOT STUDY TO DETERMINE THE LEVELS AND STATIC STIFFNESS INDEX ACHIEVED IN FOUR VELCRO WRAPPING COMPRESSION DEVICES

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Introduction: Velcro wrapping systems are widely used in the treatment of Lymphoedema and venous conditions. To date no research has been conducted to compare the wrapping devices used in practice.

Aim: The aim of this study was to create a reference point for clinicians to select a velcro wrapping system which is suitable for the treatment and maintenance of oedema, for individual patients, based on its level of compression and static stiffness index. The objectives included trying to determine if velcro wrapping devices achieve suitable and similar levels of compression on application and Static Stiffness Index greater than 10 mmHg on standing.

Method: The research design was a pilot experiment, using a convenience sample, to test the pressure achieved on application of the velcro wrap and when standing, using a Kikuhime pressure monitor. A total of 25 participants had wraps applied a total of 120 times, ensuring 30 readings were taken for each wrap. Ethical consent was given from Wolverhampton University ethics committee.

Results: The study demonstrated that velcro wraps achieved levels of compression between 30-40 mmHg and a Static Stiffness Index greater than 10 mmHg, allowing for rejection of the null hypothesis.

Conclusion: The findings of the research support the use of velcro wrapping devices in the treatment and management of lymphoedema and could be recommended as a suitable alternative to compression bandages and garments.

[8] LYMPHATIC FILARIASIS: A REVIEW OF THE NEGLECTED TROPICAL DISEASE CAUSING SEVERE LYMPHOEDEMA

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Introduction: This review aims to summarise our current knowledge of Lymphatic Filariasis, reflect on the progress of GPELF, and subsequently identify where treatment practices may be improved to aid the elimination programme

Method: This literature search was conducted using the following databases; Cochrane Database of Systematic Reviews, Scopus, Science Direct, PubMed and Medline. The following search terms were used: "Lymphatic Filariasis", "Neglected Tropical Diseases", "World Health Organisation" OR "WHO" OR "Global Plan to Eliminate LF" OR "GPELF", immune*, patho*, vaccin*, MDA.

Results: Of the 81 countries endemic for LF, 52 have begun implementing Mass Drug Administration (MDA), 19 have yet to begin, and 18 have moved to post-surveillance stages. Studies analysing post-surveillance techniques have shown methods historically used may not be as sensitive as others. Furthermore, a study reviewing the impact of 34 years of MDA treatment showed evidence of resurgence of transmission. The complex host-parasite relationship and modulation of the immune system is still not fully understood. Studies addressing the cultural context of the countries in which lymphatic filariasis is endemic in, is showing significant differences between scientific understanding of cause and treatment and patient understanding.

Conclusion: GPELF has made good progress in its MDA aims, however morbidity and management programmes continue to lag behind. The question of what happens once MDA treatments stops remains un-answered, and novel treatments such as vaccinations therefore may become necessary. Finally, patient education sensitive to cultural backgrounds is of paramount importance in administering treatment.

[9] DERMATOPATHIC LYMPHADENOPATY: ALERT AXILLARY MASS IN WOMAN WITH HISTORY OF BREAST CANCER

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The presence of axillary enlarged lymph nodes in the follow-up of a woman with a history of breast cancer should always be thouroughly indagated.

Dermatopathic lymphadenopathy presents a specific pathologic pattern found within the lymph nodes and is usually associated with cutaneous rashes.

Patients with variuos skin conditions can develop regional lymphadenopathy, which can result in the asymptomatic enlargement of the lymph nodes, especially in the inguinal, axillary and cervical regions.

Dermatopathic lymphadenopathy should be considered in the differential diagnosis also in patients with minimal cutaneous findings.

Dermatopathic lymphadenopathy is a benign process and management of these patients consists in simple clinical, mammographic and ultrasonographic follow-up.

[10] TEMPORAL CHANGES IN INTERFACE PRESSURE OF MULTILAYER BANDAGES ON THE UPPER EXTREMITY

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Aim: Multilayer bandages (MLB) are well known to be useful in treating lymphedema. We aimed to clarify temporal changes in interface pressure of MLB.

Method: Participants comprised 10 healthy female volunteers. Interface pressure was measured using a pressure-sensing device (Picopress®). The probe was placed on surface of upper limb at the following six locations: medial and lateral sides of the wrist, 5 cm distal to the elbow on radial and ulnar sides of the forearm, and 10 cm proximal to the elbow on medical and lateral sides of the arm. The interface pressure immediately after MLB application was defined as Baseline 1. Data were collected at 1-hour intervals for 8 hours after MLB application and hourly measurements were compared to Baseline 1 using Dunnett's test. Additionally, the interface pressure at 8 hours after application, showing the loosest bandaging, was defined as Baseline 2. Hourly measurements at each location were also compared to Baseline 2.

Results: At each measurement location, the interface pressure gradually decreased every hour. The interface pressure had already decreased significantly ($p < 0.05$) 1 hour after MLB application compared to Baseline 1. The interface pressure 3–5 hours after application showed similar results to the 8-hour pressure measurements. There were no significant differences between 3–5 hours and Baseline 2.

Conclusion: The results indicate that hourly reapplication of bandages is the best compression status; however, it is not practical. Therefore, we recommend MLB reapplication every 3–5 hours after the initial application for continuing effective compression therapy.

[11] A MULTIDIMENSIONAL INTERVENTION OF EARLY COMPRESSION THERAPY AND EXERCISE IN WOMEN TREATED WITH GYNECOLOGICAL CANCER AT RISK OF DEVELOPING LYMPHEDEMA: A PILOT RCT PROTOCOL

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Introduction: The incidence of developing lower limb lymphedema after treatment for gynecological cancers is estimated at 10% to 38%. The resulting persistent symptoms of swelling, achiness and difficulty walking have long-term impacts on mobility, self-image, and may also predispose patients to recurrent skin infections. These negative outcomes and the cost of lymphedema management to the healthcare system, make it essential to identify strategies to reduce the risk of lymphedema development in this population.

Aim: To evaluate the effect of early compression therapy with individualized exercise on the incidence of lower limb lymphedema over 12 months post-operatively in patients treated for gynecological cancer.

Method: This is a pilot (n=50) randomized controlled trial, we are recruiting patients with gynecological cancer treated at the McGill University Health Centre (MUHC) Royal Victoria Hospital and the Jewish General Hospital in Montreal, Quebec, Canada.

Inclusion criteria: Patients scheduled to undergo surgical lymph node dissection having a diagnosis of one of the following: Grade 2 or 3 endometrial cancer; Stage 1b1 or stage 2a cervical cancer; Stage 1, 2 or 3 vulvar cancer.

Procedures: At the MUHC Lymphedema Clinic, over a 12-month period, on five occasions a medical exam and bilateral limb measurements will be administered. Four weeks post-operatively both groups will receive standard education on lymphedema risk reduction and the experimental group will receive individualized education on exercises and will be prescribed compression class 1 stockings.

Results: As recruitment is presently well underway we expect to have preliminary results to present by June 2017.

[12] TREATMENT OF THERMAL ENVIRONMENT IN LYMPHOEDEMA

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Dopo un breve cenno sulla patogenesi del linfedema, sia primitivo che secondario, si passa a considerare la moderna strategia terapeutica di questa disabilita' consistente nel trattamento decongestivo in ambiente termale, considerando le proprieta' salutari delle componenti fisiche e biochimiche dell'acqua sulla matrice extracellulare.

Si elencano le varie tipologie di intervento sul circolo linfatico in ambito sia idrochinesiterapico che a caldo secco.

Si punta l'attenzione inoltre, su un aspetto particolarmente importante e punto di forza del trattamento del linfedema in ambito termale rappresentato dall'elelevato indice di gradimento che suscita questa tipologia terapeutica nei confronti della compliance articolare spesso compromessa.

Si riportano infine dei risultati ottenuti in termini centimetrici su arti di pazienti trattati in "ambiente a secco" (classico t.d.c.) ed in "ambiente in umido" (termalismo)

[13] SUPERMICROSURGICAL LYMPHATIC-VENULAR ANASTOMOSIS FOR LIMBS LYMPHEDEMA: THE CORRECT COMBINATION OF PREOPERATIVE PLANNING WITH INTRAOPERATIVE CHOICES

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Introduction: Supermicrosurgical lymphatic-venular anastomosis (LVA) is indicated in many lymphatic disorders such as lymphedema, lymphocele and lymphorrea. This procedure creates different patterns of multiple connections between superficial lymphatic vessels and subdermal venules achieving alternative routes for the lymph flow.

Method: Preoperative planning is executed by lymphoscintigraphy and lymphography. During surgery we execute multiple small incisions (1-3cm.) along the limb. Through these accesses we search for superficial lymphatic vessels and venules. Suitable lymphatic vessel should be of good quality, maintaining a good lumen (usually it ranges from 0.2 to 0.8 mm) with not sclerotic walls and good lymph peristalsis. Vein should match in size as much as possible with the lymphatic vessel and should be connected to a valvular system, showing no blood backflow. Anastomosis technique must be perfect and patency of the anastomosis after every connection must be confirmed.

Implications: Supermicrosurgical LVA is very safe and can dramatically improve limbs lymphedema decreasing swelling, symptoms and stopping infections, at the cost of a minimally invasive procedure, executed under local anesthesia, with mild sedation. Finding good lymphatic vessels is a prerequisite for the good success of surgery.

Conclusion: Preoperative study allows to give the correct indication to this procedure. Surgery can improve very much the effect of physiotherapy bypassing the obstruction of the lymphatic circulation. Preoperative and postoperative physiotherapy is necessary and therefore an integrated approach is mandatory.

[14] BACTERIA ARE PRESENT IN SUBCUTANEOUS TISSUE IN OBSTRUCTIVE LYMPHEDEMA - LONG-TERM PENICILLIN PREVENTS THEIR PROLIFERATION AND SUBSEQUENT HOST RESPONSE

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Introduction: Dermato-lymphangio-adenitis (DLA) occurs in about 50% of cases with obstructive lymphedema of lower and upper limbs. Each recurrence is followed by progression of edema and irreversible increase in limb size. Question arises whether bacteria are permanently present in lymphedematous tissues.

Aim: To identify bacteria in lymphedematous tissues, their location, migratory properties and responsiveness to antibiotics.

Method: Study was carried out on 50 patients with obstructive lymphedema of lower limbs. Skin and subcutaneous tissue fragments were harvested under strict aseptic conditions in operating room. Scalpel, forceps and gauze were cultured. Bacterial fall-down was routinely measured. Specimens were placed on Hemoline plates and put into warm box for 3-5 weeks. Bacterial strains from colonies were identified. In 18 cases skin and subcutis fragments were evaluated in scanning electronmicroscopy. Patients were given long-term penicillin for 6 months.

Results: On-plate culture revealed delayed migration and confluent colony formation around and on tissue fragments in over 40% specimens. Strains were Staph.epidermidis and other coagulase-negatives. Staph. aureus meticillin-sensitive was other most common. All were sensitive to standard antibiotics. In some cases, slight resistance to penicillin was noted. On electromicrographs single extracellular cocci and bacilli were identified. No colonies as seen on-plates were seen. There were few macrophages close to bacteria.

Conclusion: Single bacteria are found in subcutis. Lack of immune cells in their vicinity. These are most likely “dormant” bacteria. We speculate that permanent presence of penicillin keeps them in non-proliferating state.

[15] LEG EDEMA IN LYMPHATIC INSUFFICIENCY IS LYMPHO-FIBRO-ADIPO-EDEMA

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Introduction: In chronic venous insufficiency (CVI) attention is directed at hemodynamics but not tissue changes. Edema in CVI is accumulation of tissue fluid and lymph by obliteration of damaged lymphatic pathways and nodes. MRI and US showed that fluid is only one element in increased limb volume. There is increase of fibroblasts and collagen mass, formation of multiple fibrous septa encompassing multiple fat globules in whole limb.

Aim: To study lymphatics, fluid volume, fibrous and fat tissue mass and their macro- and micro-topography. Methods. Twenty patients with CVI of lower limbs CEAP 3 and 4 were studied. Ultrasound and MRI of limb were done. Biopsy specimens were collected during varicous veins surgery. Macroscopical evaluation of solid tissue structure, sites of fluid accumulation, subcutis immunohistology, water content of specimens were done.

Results: Lymphoscintigraphy. Interrupted lymphatics, atrophied lymph nodes.
MRI. A 3-7 mm thick skin layer. Subcutis with a honeycomb structure and septa of different thickness depending on CEAP stage. Fat 20-30%, fibrous elements 30%, 15-40% of water. Ultrasound. Picture less clear but subcutis solid structure occupying up to 50% of surface. Biopsy specimens. Multiple fluid lakes 30-40% of area (not seen in controls). Dilated perivascular spaces. Dry mass after dessication up to 50% (controls 30%).

Conclusions: In chronic venous insufficiency limb volume is increased because of more fibroblasts, adipocytes and collagen mass, as well as accumulation of fluid. Early intensive high pressure compression therapy is recommended to prevent tissue changes and not the practiced low pressure only limiting blood stasis.

[16] TONOMETRY OF DEEP TISSUES FOR SETTING EFFECTIVE COMPRESSION PRESSURES IN EDEMATOUS LIMBS

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Introduction: Methods for evaluation of intermittent pneumatic compression (IPC) are based on limb circumference and volume. There is another important factor for evaluation of compression effects, namely elasticity measured by tonometry.

Aim: 1. to measure applied tonometer force and tonometer- generated edema fluid pressures, 2. to plot tonometer force against fluid pressure data to obtain correlation curve for setting ICP pressure,3. Based on 2 and 3 findings to work out a formula for setting pressures in pneumatic device for an individual patient and at various limb levels.

Method: Deep tissue tonometry force and tissue fluid pressures under tonometer indentor were measured in lower limbs in a group of 20 patients with lymphedema stage I-III.

Results: 1. deep tissue tonometry provided data on pressure generated in tissue fluid under tonometer indentor penetrating at depth of 10mm. 2. plotting tonometer force against tissue fluid pressures showed threshold pressure necessary for moving edema fluid, 3. formula based on tonometry values, for setting ICP pressures at levels initiating fluid flow was worked out.

$$Pp = T \times (25+13=38) + C3$$

Pp- pump pressure in mmHg,T- number of kg/sq.cm indenting tissues by 10mm, 25 mmHg + 13 mmHg -mean tissue fluid pressure under tonometer indentor/1000g/sq.cm + one sd, C30mmHg – mean pressure loss in tissues during IPC (difference between inflated cuff and tissue fluid pressure). Example : Pp=2.0 x 38+30=106mmHg in the inflated cuff (predicted tissue fluid pressure 76mmHg)

Conclusion: Deep tissue tonometry of limbs is useful for setting IPC devices at compression pressures mobilizing edema fluid.
Tonometry of deep tissues for setting effective pressures for intermittent pneumatic compression in lymphedema of limbs

[17] PREVALENCE AND CHARACTERISTICS OF LYMPHEDEMA

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Aim: Lymphedema is estimated to affect up to 1,000,000 Canadians but remains under-recognized and under-treated.(1)(2)(3) The purpose of this study was to determine the prevalence, clinical characteristics, and treatment practices of lymphedema in an outpatient wound management clinic at a Canadian tertiary care teaching hospital.

Method: Approval was obtained from the Western University (Canada) Human Research Ethics Board. Lymphedema patients were identified using an administrative database of the clinic's patients. All clinic visits were assigned an ICD-9 code for the most responsible diagnosis for the visit. All charts with the diagnostic code for lymphedema (457) were reviewed. A total of 326 patients, treated between May 2006 and July 2014, were included in the study.
Data collection took place from June 2014 to July 2014. Patients were anonymized using a randomly-generated alphanumeric code. Age, sex, date of diagnosis, type and stage of lymphedema, surgical history, prescribed treatments, and comorbidities were recorded. Data analysis was performed in Excel.

Results: Lymphedema patients represented approximately 20% of the clinic's total volume. The mean age at diagnosis was 67±15.5. Only 12% of patients had a documented diagnosis of lymphedema at the time of referral. The rest were diagnosed by the clinic.
The vast majority of patients had secondary lymphedema (96%). The most common possible etiologies were venous disease (75%), non-cancer surgery (61%), and obesity (45%). Cancer treatment was a factor in only 10% of patients.
The most common treatment modality prescribed at first visit and most recent follow-up were compression bandages (84%) and compression garments (63%), respectively. On average, patients had 7± 3.3 comorbid conditions and took 8±4.6 concomitant medications. The most common comorbidities were venous disease (73%), hypertension (60%), and obesity (46%).

Conclusion: A significant portion of the clinic's patients had lymphedema. Although cancer-related lymphedema is considered to be the most common form of lymphedema in developed countries,(4)"container-title":"PloS one","page":"e114597","volume":"9","issue":"12","abstract":"BACKGROUND Lymphedema is a common complication of cancer therapeutics; its prevalence, treatment outcomes, and costs have been poorly defined. The objective of this study was to examine lymphedema prevalence among cancer survivors and to characterize changes in clinical outcomes and costs associated with a defined therapeutic intervention (use of a pneumatic compression devices [PCD] most clinic patients had secondary lymphedema unrelated to cancer, possibly due to the lack of dedicated treatment programs for these patients. Treatment practices at the clinic followed the best practice guidelines of using bandages for initial treatment and garments for maintenance.

[18] CIRCUMFERENTIAL AND VOLUME MEASUREMENT IN LYMPHEDEMA MANAGEMENT: CAN WE COMBINE ACCURACY, REPRODUCIBILITY, PRACTICALITY AND AFFORDABILITY IN THE SAME DEVICE?

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INTRODUCTION: To take circumferential measurements nowadays, we have to choose between: accurate but expensive and bulky material (scanners, water displacement, …) or inaccurate but affordable and practical material (tapeline,…).
To be considered accurate, the error can be of few mm.

OBJECTIVES: Study reproducibility and accuracy of a new device (PeriKit) between three assessors.

METHOD: 32 healthy subjects took part in this study where no edema variability is possible. The measurements were taken on the upper limb each 4 cm beginning with a reference point(RP) on the wrist joint. The measures were retaken independently within 1 hour. The PeriKit consists in a patented graduated adaptable guide installed longitudinally on the limb on which sliding devices (sld) are installed.

RESULTS: Concerning the circumferential measurements, the interclass correlation (ICC) was 0.99. The Bland and Altman test confirmed the reproducibility. Concerning the RP taking/retaking, no statistically changes were noticed between the first and the second assessment.

CONCUSIONS: The PeriKit shows a high degree of reproducibility and accuracy with major advantages:
-High precision in retaking the bony landmarks (mean error < 2 mm). -No error accumulations between each 4 cm. -97% of the measurements taken showed a difference < 3 mm. -No tension is put on the tapeline. -No more ink marks on fragile skins are needed.

With these advantages and the possibility to measure extremities (hand and foot) the PeriKit can be considered nowadays as one of the most precise practical and affordable measurement device that can be used everywhere and by everyone.

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