

Aging and Chronic Oedema

Understanding the Puzzle
and Driving Change



THE PUZZLE

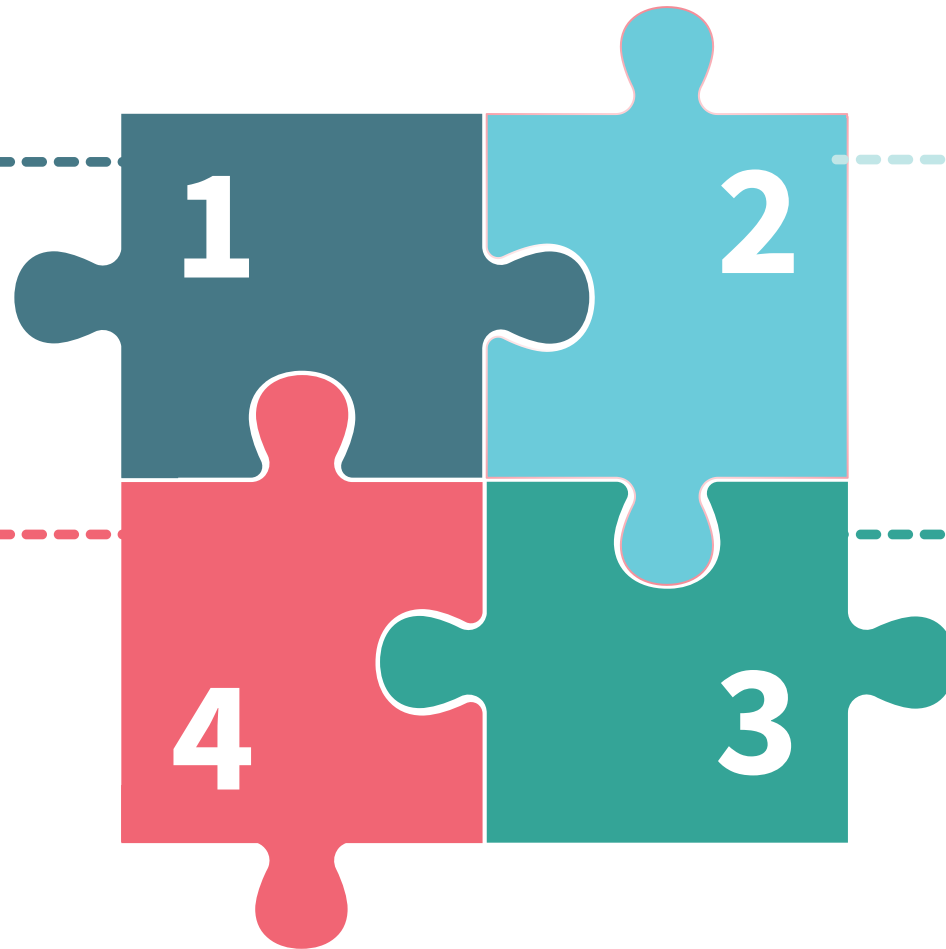
TO DRIVE CHANGE

Insights

Lymphatics and ageing.
Chronic oedema in ageing
population

Act Now

Where to next: ageing
person, YOU, health
system, research



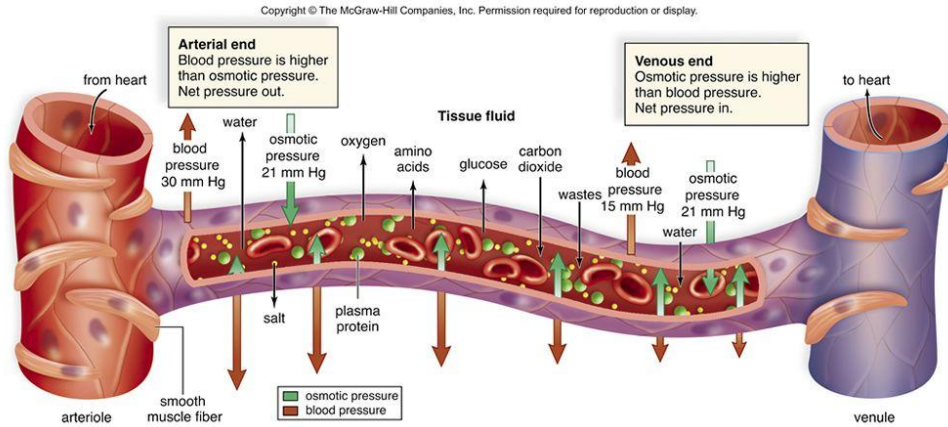
Magnitude & Impact

Prevalence, side effects,
impact

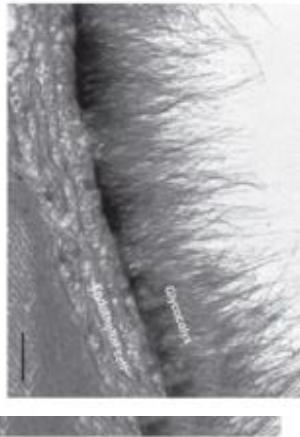
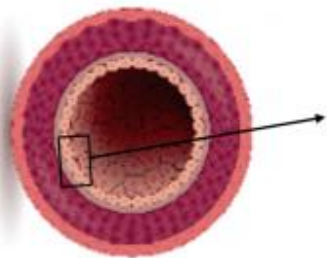
Management

What to consider and
possible strategies

Insights

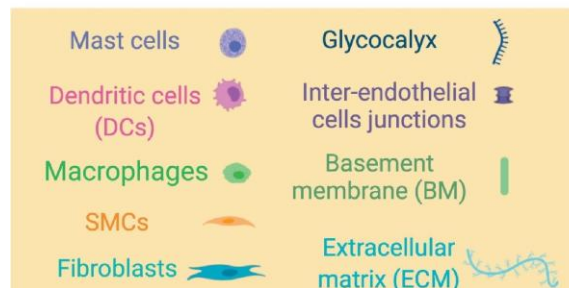
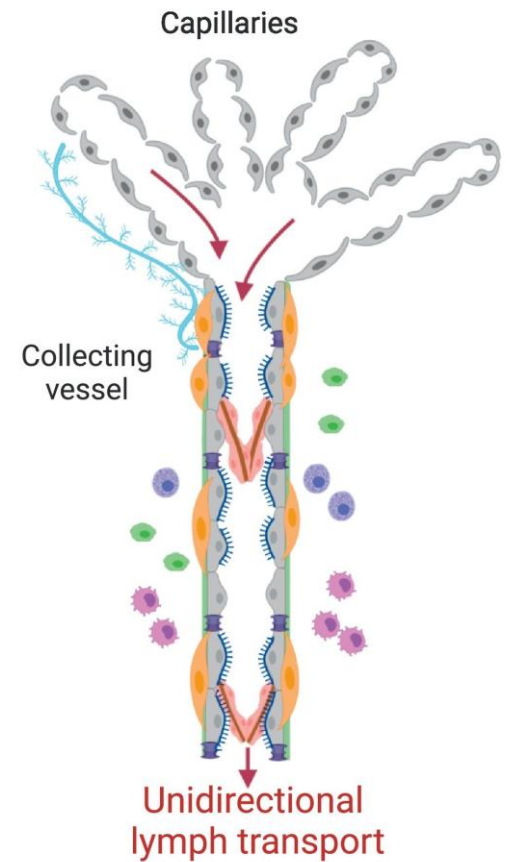


- Starling's Law was incorrect
- Endothelial glyco-calyx' seen on electron microscope. **Slimey-hairy lining** in the capillaries
- 2010 Levick and Michel '**Revised Starling Law**'
- There is a net outflow across the capillary bed, and **the lymphatic system collects and returns the excess fluid**

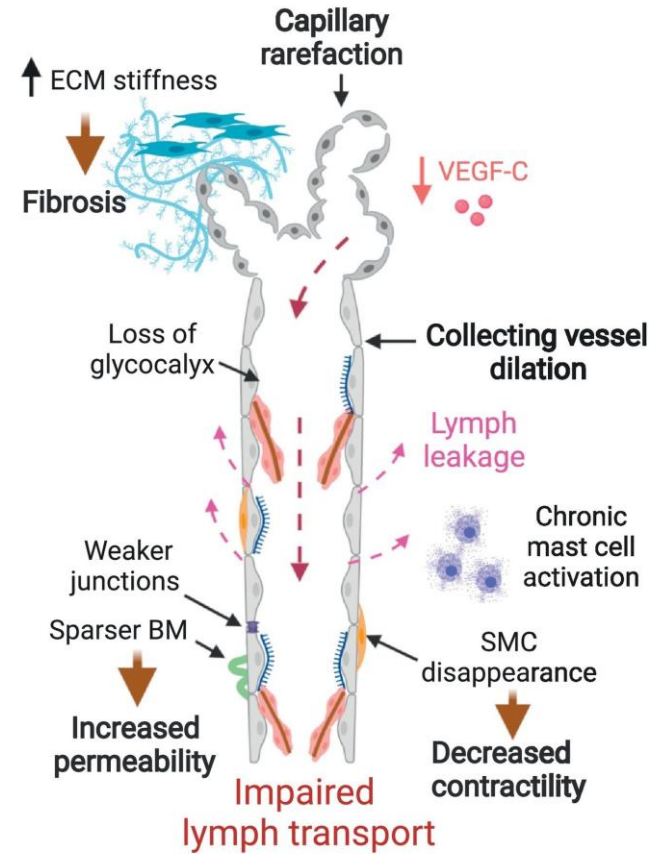


Oedema the lymphatic system is failing to remove all the excess fluid

Normal lymphatic vasculature



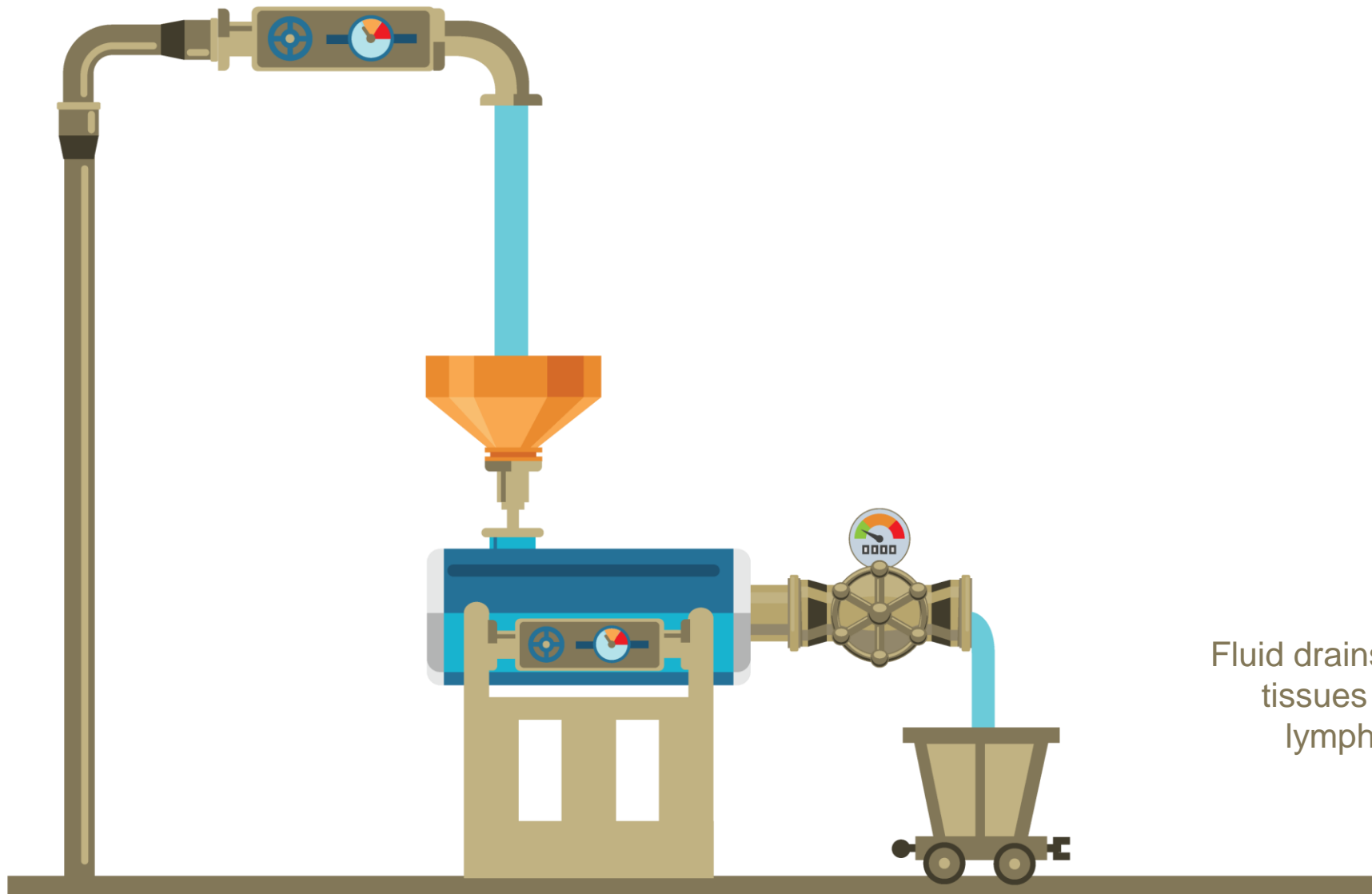
Aged lymphatic vasculature



- Tissue inflammation
- Autoimmunity
- Reduced tumor therapy efficacy
- Neurodegeneration

Source: A Gonzalez –Loyal, T V Petrova. Development and aging of the lymphatic vascular system. *Advanced Drug Delivery Reviews* 169 (2021) 63–7.

Fluid moves into the tissues

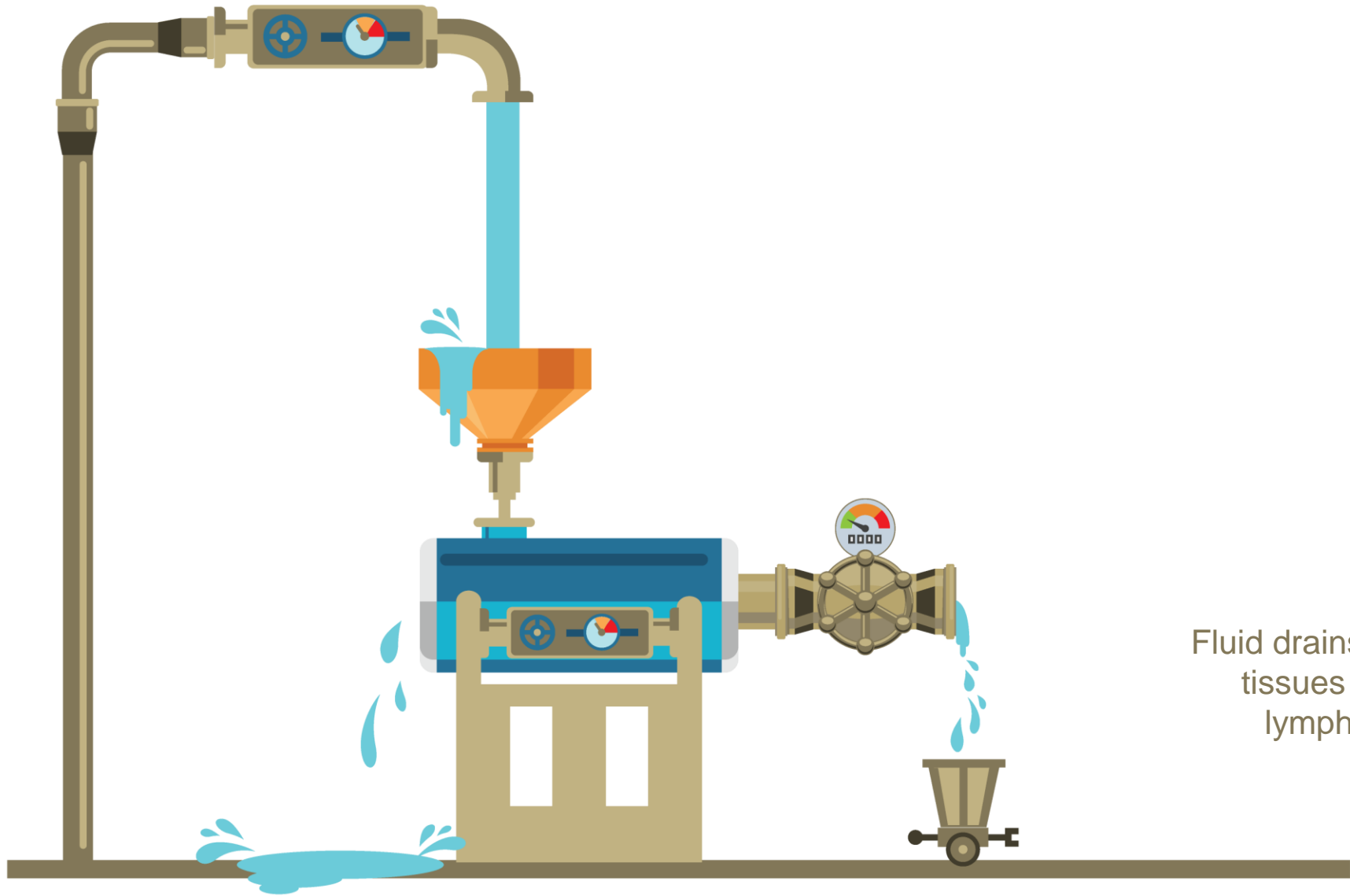


Fluid drains from the tissues by the lymphatics

In healthy legs, the circulation is in balance



Fluid moves into the tissues







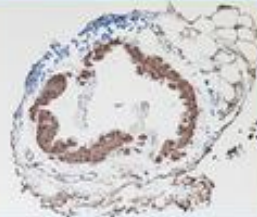

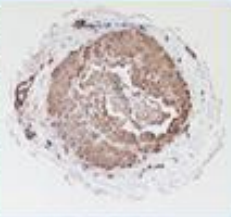
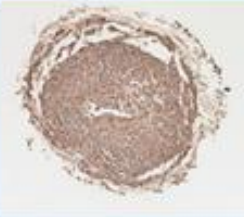


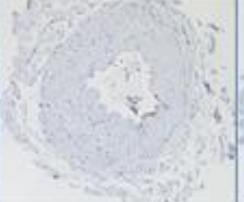

Fluid drains from the tissues by the lymphatics

In swollen legs, too much fluid stays in the tissues

Lymph vessel changes

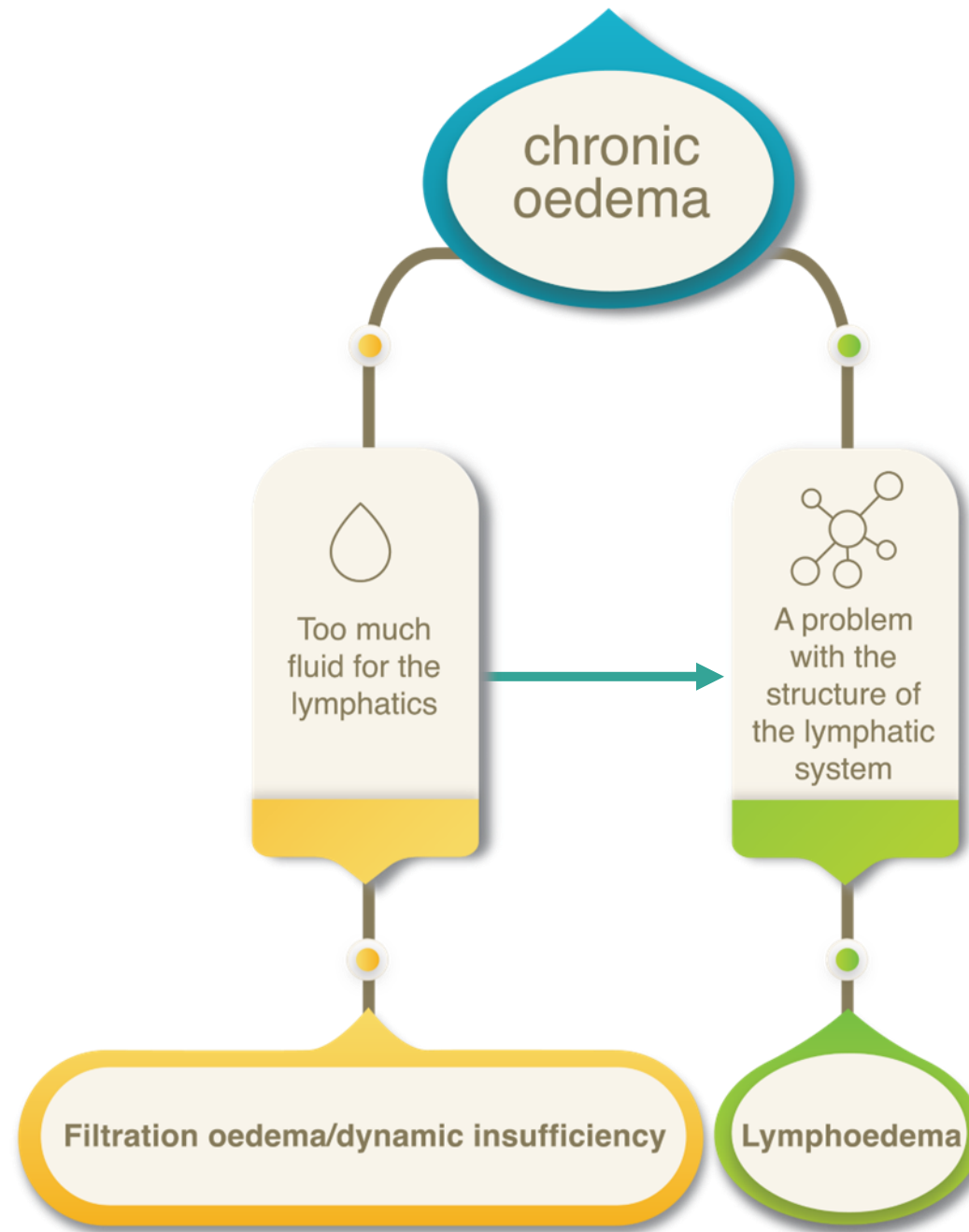
Degenerative changes in lymphatic vessels subject to prolonged high flow

Figure 3. Classification of the types of collecting lymphatic vessels and the corresponding immunostaining findings.

Type	Normal	Ectasis	Contraction	Sclerosis
Immunostaining				
α -SMA				
Podoplanin				

Source: PLoS ONE July 2012 Vol7 Issue 7 e41126

Chronic oedema or lymphoedema?



Chronic oedema

Oedema present for more than 3 months regardless of the cause.

Moffatt, C., et al. (2019). "The Concept of Chronic Edema-A Neglected Public Health Issue and an International Response: The LIMPRINT Study." [Lymphat Res Biol](#) **17**(2): 121-126.



What do we know?

- Wide range
- 2.63% - 100%

Prevalence

- Wounds
- Cellulitis
- High cost to manage
- Reduced quality of life

Risk Factors

- Increasing age
- Reduced mobility
- Diabetes
- Heart failure
- Obesity
- Wounds

Associated with

2020 - 2022 Australian Study

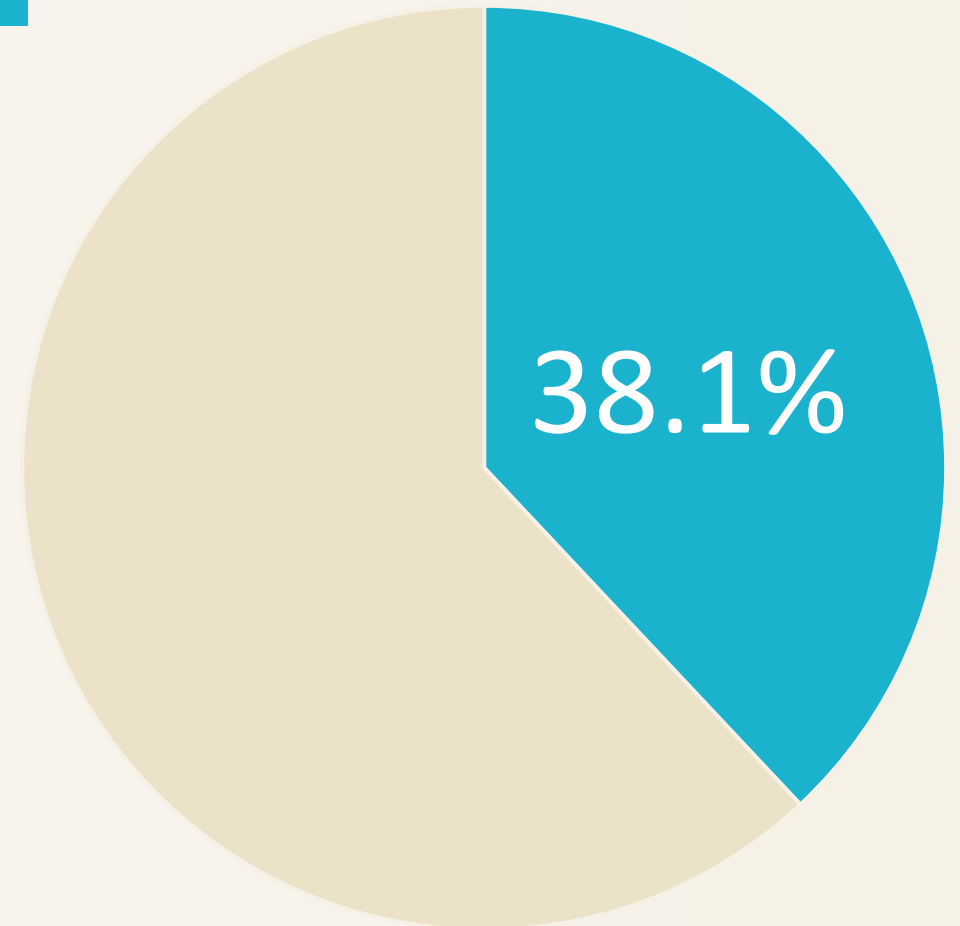
459 patients included for analysis

Chronic oedema = 175

- Women – 124 (70%)
- Men – 51 (30%)

Age (years), mean (SD):

- No oedema - 79.95 (7.25)
- Oedema - 80.97 (7.71)



■ Oedema ■ No oedema

Chronic Oedema Identification Assessment

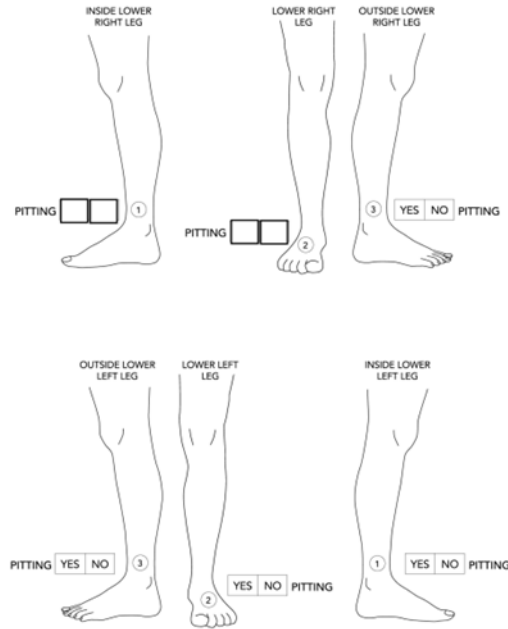
Subjective Assessment

1. Have you noticed any swelling in your ankles? Yes No Don't know
2. Have you ever noticed this in the past e.g. summer? Yes No

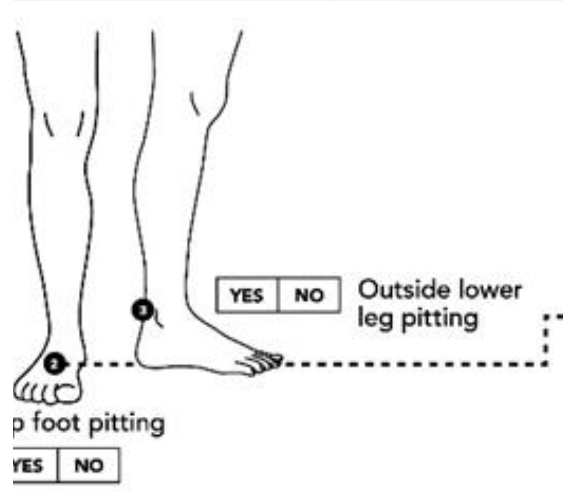
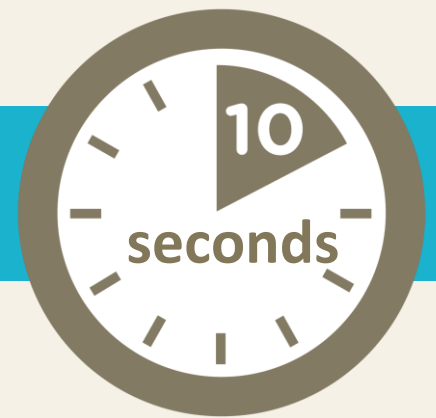
Physical Assessment

3. Do the client's legs, below the knee + / - feet look swollen? Yes No

4. **Pitting test**
With your thumb press down on each of the locations indicated in the diagram below. Hold for 10 seconds in each spot and indicate if pitting oedema is present (YES/NO) if it leaves an indent. See below



Method



Assessment Completed By: _____ Designation: _____ Date: _____

Results: Characteristics

Characteristic	No oedema (N = 284)	Oedema present (N = 175)
Dementia, N_(%)	61 (21.50)	26 (14.90)
Hypertension, N_(%)	191 (67.30)	127 (72.60)
Diabetes, N_(%)	91 (32.00)	60 (34.30)
Chronic heart failure, N_(%)	62 (21.80)	86 (49.10)

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Diabetes, N_(%)	91 (32.00)	60 (34.30)
Chronic heart failure, N_(%)	62 (21.80)	86 (49.10)
Wound, N_(%)	1 (0.40)	18 (10.30)
Cellulitis, N_(%)	1 (0.40)	12 (6.90)
Mobility – Aid, N_(%)	169 (59.50)	139 (79.40)

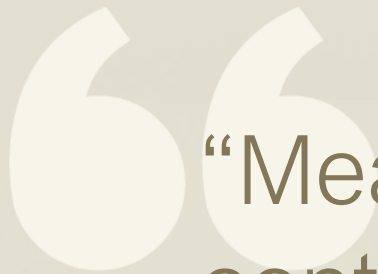
Results: Risk Factors

Independent predictors of chronic oedema by binary logistic regression

Variable	Odds Ratio (95%CI)	P-value
Dementia	0.59 (0.35-1.01)	0.056
Gender (female)	1.52 (0.96-2.40)	0.076
Chronic heart failure	3.73 (2.41-5.79)	<0.001
Use of a mobility aid	2.38 (1.51 -3.75)	<0.001

Well-controlled oedema
is crucial; associated
with a 50% lower risk of
wounds ($P < .001$).

Burian, E. A., Karlsmark, T., Nørregaard, S., Kirketerp-Møller, K., Kirsner, R. S., Franks, P. J., ... & Moffatt, C. J. (2022). Wounds in chronic leg oedema. *International Wound Journal*, 19(2), 411-425.



“Measures to improve the control of swelling may have a major effect on the incidence of cellulitis, being potentially preventable.”



Cellulitis in chronic oedema of the lower leg: an international cross-sectional study

E.A. Burian¹, T. Karlsmark¹, P.J. Franks², V. Keeley³, I. Quéré⁴ and C.J. Moffatt^{1,5,6}

¹Department of Dermato-Venereology & Wound Healing Centre, Bispebjerg Hospital, Copenhagen, Denmark
²Centre for Research and Implementation of Clinical Practice, London, UK
³Centre for Research and Implementation of Clinical Practice, Royal Derby Hospital, Derby and University of Nottingham Medical School, Nottingham, UK
⁴Lymphoedema Department, Montpellier University Hospital Centre, University of Montpellier, France
⁵Department of Vascular Medicine, Nottingham Trent University, Nottingham, UK
⁶School of Social Sciences, Nottingham Trent University, Nottingham, UK
^{*}Nottingham University Hospitals NHS Trust, Nottingham, UK

Summary

Background Cellulitis and chronic oedema are common conditions with considerable morbidity. The number of studies designed to assess the epidemiology of cellulitis in chronic oedema is scarce.
Objective To investigate the prevalence and risk factors of cellulitis in chronic oedema, including lymphoedema.
Methods A cross-sectional study included 40 sites in nine countries during 2014–17. Adults with clinically proven unilateral or bilateral chronic oedema (oedema > 3 months) of the lower leg for cellulitis within the last 12 months. Surveys were frequency and risk factors for cellulitis within the last 12 months. Results Out of 7477 patients, 15.78% had cellulitis within the last 12 months with a lifetime prevalence of 37.47%. The following risk factors for cellulitis were identified by multivariable analysis: wounds (odds ratio (OR) 2.37, 95% confidence interval (CI) 1.04–1.66), male sex (OR 1.32, 95% CI 1.15–1.52) and diabetes (OR 1.27, 95% CI 1.08–1.49). Controlled swelling was associated with a reduced risk (OR 0.59, 95% CI 0.51–0.67). In a subgroup analysis, the risk increased with the stage of oedema (International Society of Lymphology, stage II OR 1.23–3.38) and stage III OR 4.88 (95% CI 2.77–8.56).
Conclusions Cellulitis in chronic leg oedema is a global problem. Several risk factors for cellulitis were identified, of which some are potentially preventable. Our findings suggest that oedema control is one of these. We also identified that advanced stages of oedema, with hard/fibrotic tissue, might be an important clinical indicator to identify patients at particular risk.

What is already known about this topic?

- Chronic oedema has many different causes and is a frequent but neglected health-care problem.
- The association between chronic oedema and cellulitis is known, but few studies have clinically evaluated the size of the problem and the risk factors.
- Guidelines suggest that control of oedema is important to reduce the risk of recurrent cellulitis, but the evidence is limited.

Correspondence
Christine J. Moffatt
Email: christine.moffatt@nhs.uk

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Conflicts of interest
See Appendix for full details.

DOI: 10.1111/bjd.19803

Burian, E. A., et al. (2021). "Cellulitis in chronic oedema of the lower leg: an international cross-sectional study." *British Journal of Dermatology* 185(1): 110-118.



Management Strategies

- Person needs to make an informed decision
- Driven by the goals of the ageing person
- Early intervention is essential
- Corner stones:
 - Skin care
 - ADL
 - Exercise
 - Compression
 - Massage / IPC



4

- All adults 60 years and older should be screened for oedema in their feet and ankles
- Non health professionals can perform the screening

Act NOW

- Does your organisation screen for oedema in the legs?
- Are there more effective strategies to reduce oedema whilst you heal the wound?
- What is your decision making process for long term compression?
- Do you link with lymphoedema practitioners?

- Consider increasing your skills
- GP education
- Further research into management strategies for the older person with chronic oedema



Act NOW

National Lymphoedema Practitioners Register

The only recognised register of Lymphoedema practitioners in Australia & New Zealand



Australasian Lymphology Association

Accredited Lymphoedema Practitioner
DEDICATION • PROFESSIONALISM • EXPERTISE

