Intermittent Pneumatic Compression for the Treatment of Lower Limb Lymphoedema:

A pilot trial of Sequencing to Mimic Manual Lymphatic Drainage Versus Traditional Graduated Sequential Compression#

#With some insights and thoughts about conducting research in the NHS.

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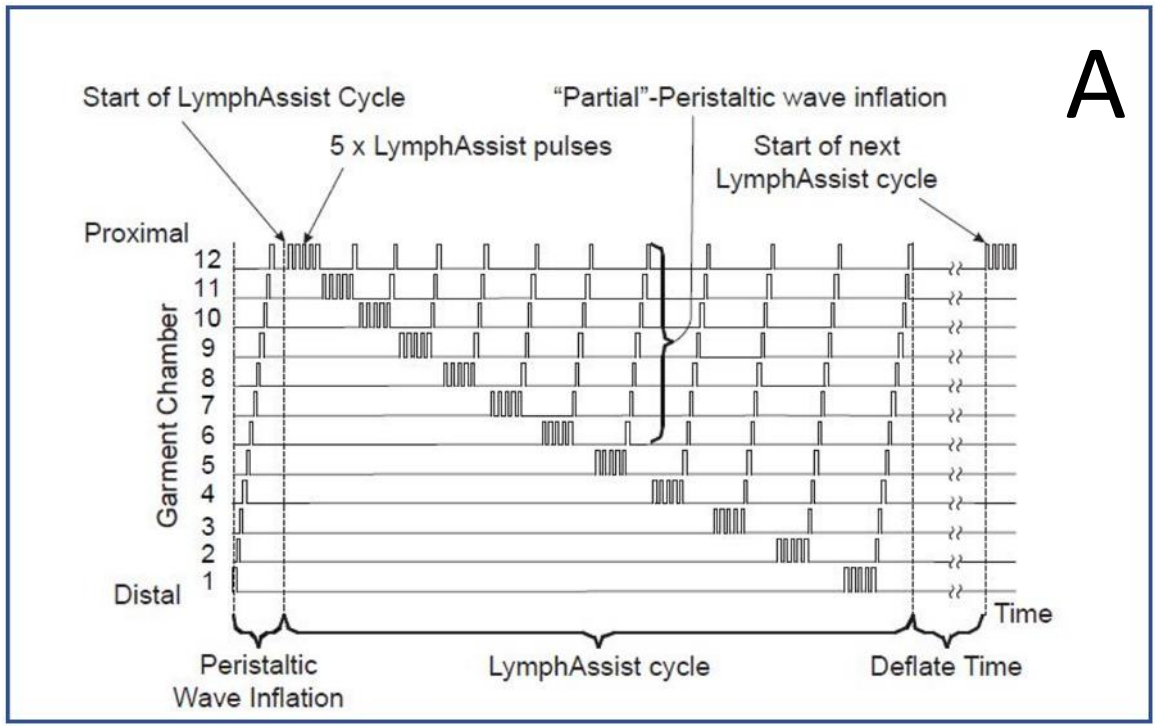
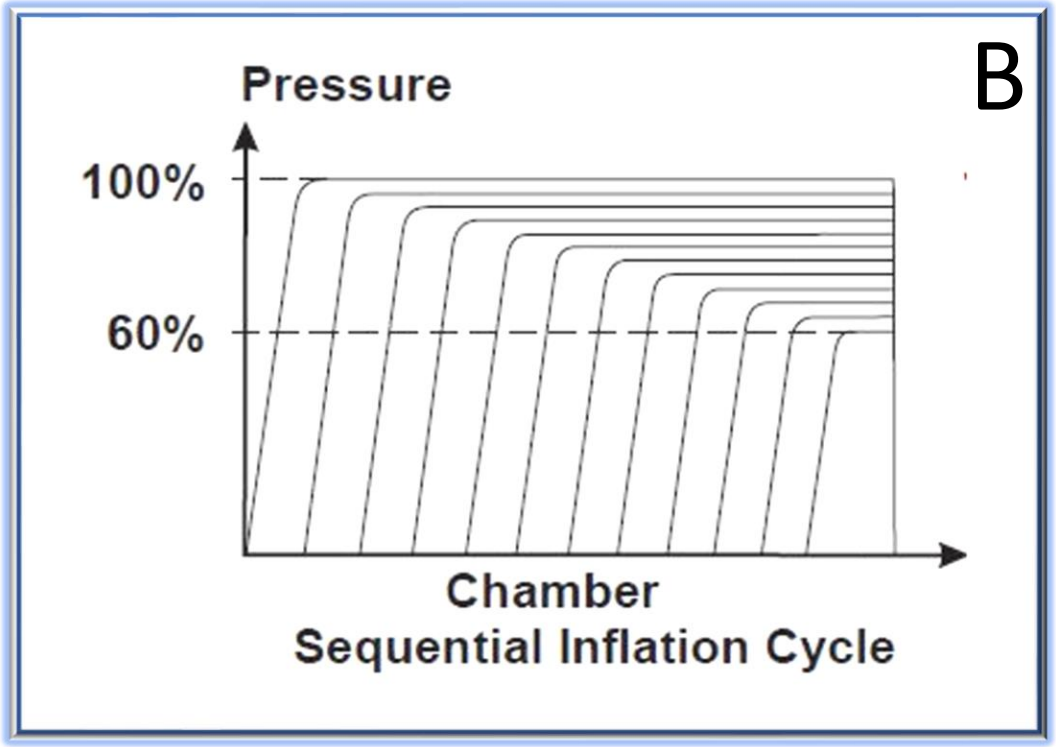
RESEARCH & DEVELOPMENT CONFERENCE **Wednesday 23rd November 2022**

Introduction: People with swollen legs due to inadequate lymph drainage can reduce the accumulation of excess fluid in the limbs by massage of the affected area.

Recent advances in technology have allowed intermittent pneumatic compression (IPC) devices to develop so that their function mimics the process and principals of manual lymphatic drainage (MLD); however, research into the effectiveness of such devices is lacking.

Aim: These studies aimed to investigate the effectiveness of a IPC technique designed to mimic MLD (LymphAssist™) (Panel A), compared with a typical sequential IPC regimen (Panel B).





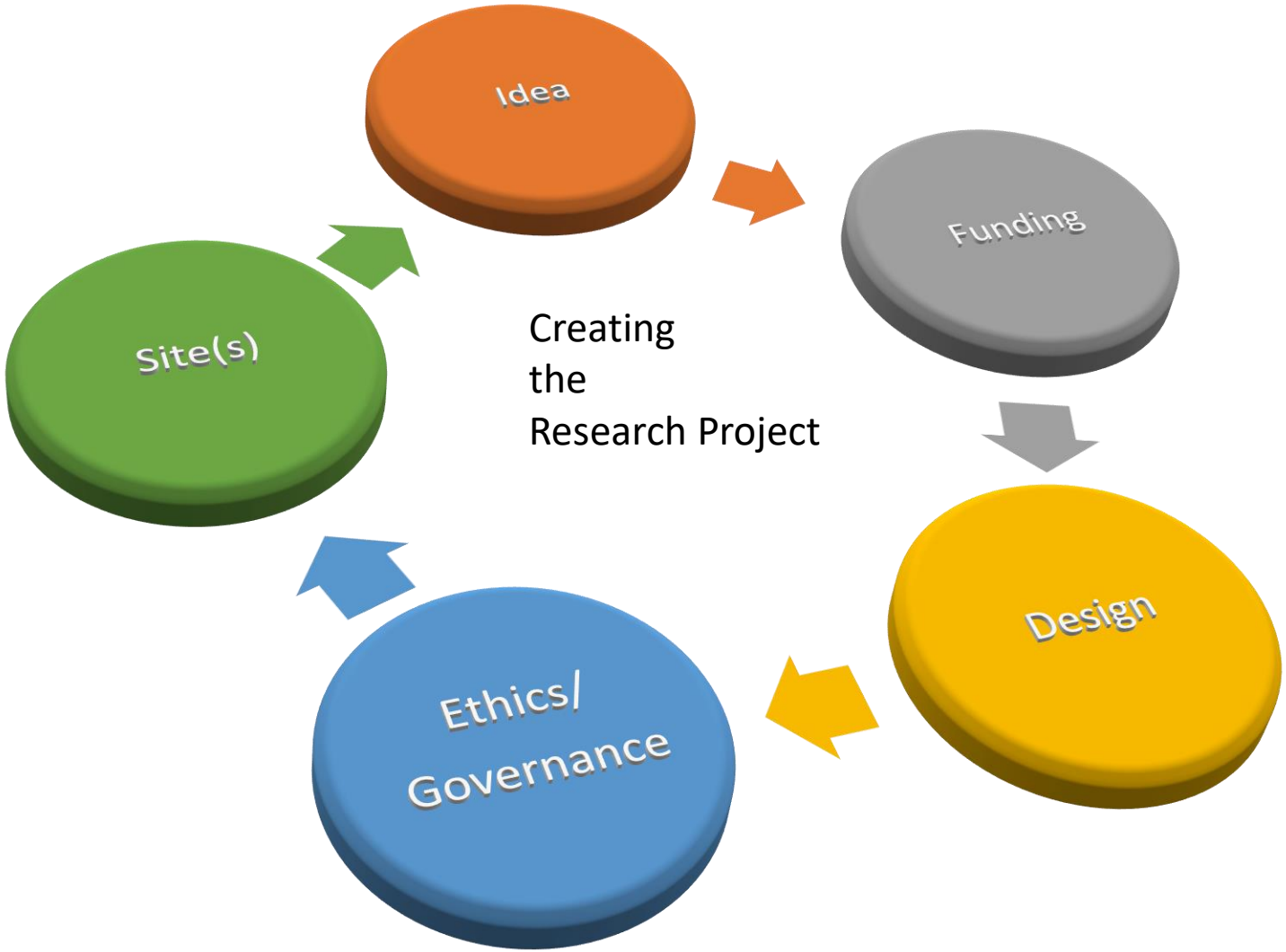
RQ. Is the new technique better or worse than the established technique?

“Research questions aren't formulated by researchers in isolation, and research questions can only be answered if the research is funded. How the research is done can fundamentally affect its impact and value to different groups”

The BMJ Research Forum team

Who is asking the question (the aims) and interested in the answer (outcomes)?

1. Patients: Relief from swollen limbs, better QOL?
2. Healthcare: Better treatment and care. Cost effective?
3. Scientist: Understanding lymph drainage, improved knowledge?
4. Manufacturer: More sales/improved technology?


Idea
Funding
Design
Ethics/
Governance
Site(s)
Creating
the
Research Project

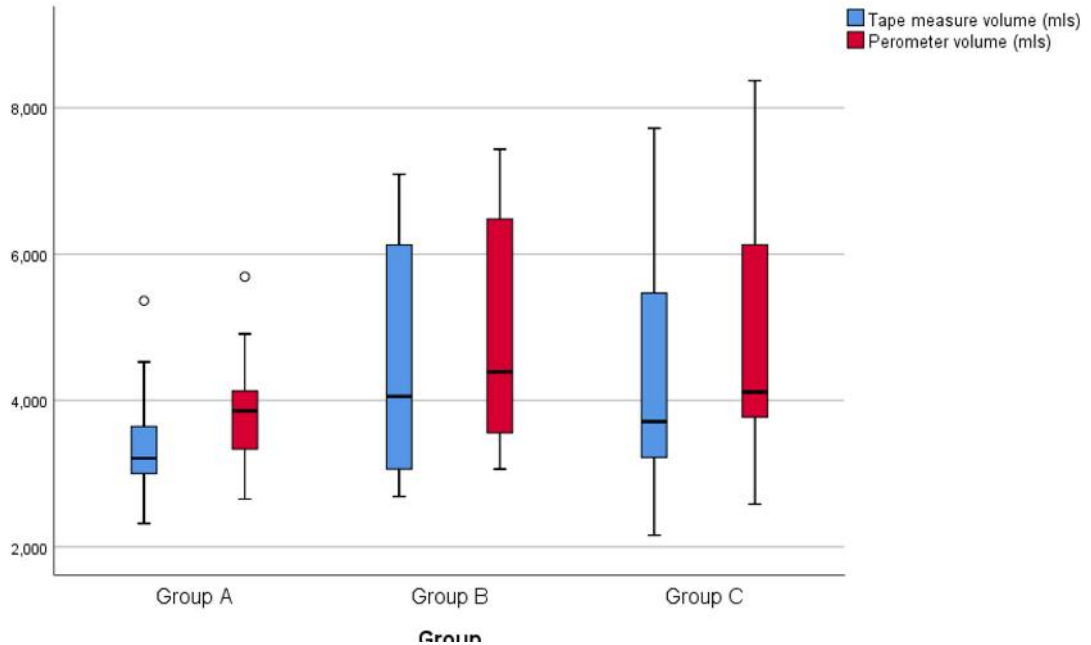
Study Design Questions

1. Outcome measure: Leg Volume?
2. How to measure: Tape or Perometer?
3. Control versus Intervention?
4. How long to treat?
5. Sample size?
6. Where to recruit participants and setting ?

Study 1

Study 2

Vs



Study 1

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MEASURING LEG VOLUME IN LYMPHOEDEMA USING OPTOELECTRONIC VOLUMETRY AND THE SEQUENTIAL TAPE METHOD

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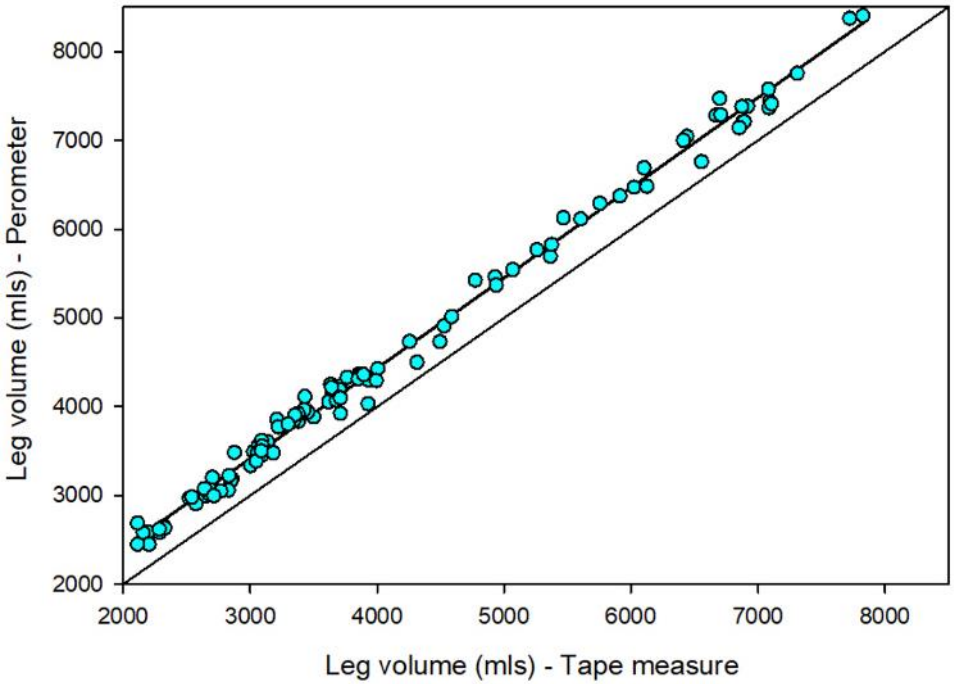
ABSTRACT

Objective: To assess the level of agreement between two techniques for measuring leg volume, infrared optical volumetry

INTRODUCTION

Lymphoedema is a chronic condition that causes swelling in the body tissues due to an excess accumulation of protein rich fluid



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Home management of lower limb lymphoedema with an intermittent pneumatic compression device: a feasibility study

Nyree Dunn, E. Mark Williams, Michelle Fishbourne, Gina Dolan & Jane H. Davies

Pilot and Feasibility Studies **5**, Article number: 113 (2019) | Cite this article

3001 Accesses | **5** Citations | **1** Altmetric | Metrics

Abstract

Background

Lymphoedema is a chronic condition that causes swelling in the body tissues. Presently, there is no cure for lymphoedema; instead, current treatment is aimed at lifelong management to help control symptoms. Intermittent pneumatic compression (IPC) therapy can be considered as an adjunct to standard lymphoedema care; however, research regarding the efficacy of this treatment modality is limited.

Fig. 2 IPC device in use (LymphAssist, Huntleigh Healthcare)

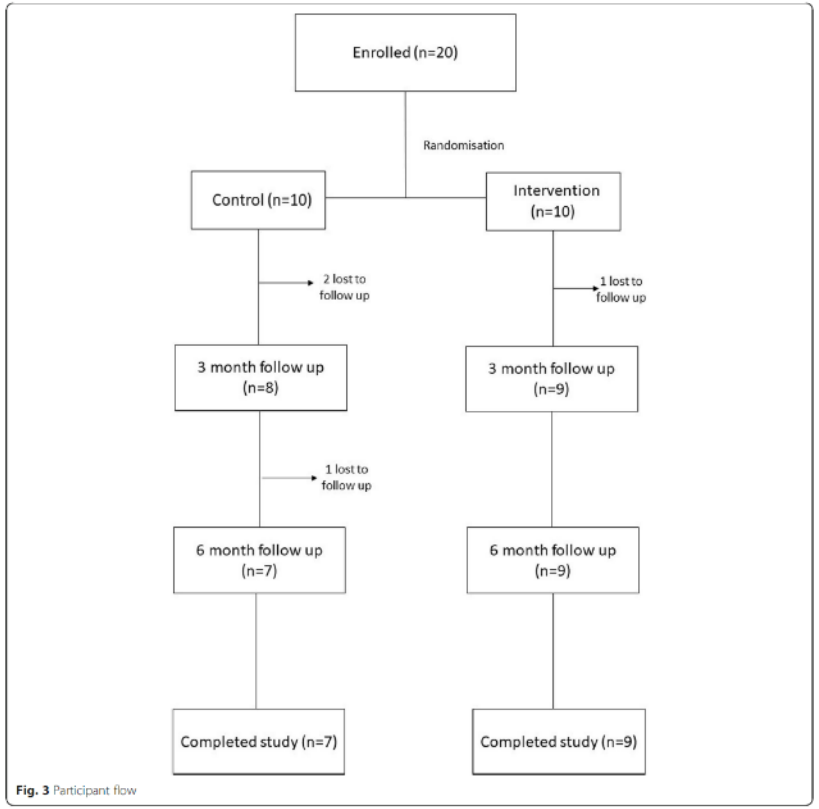
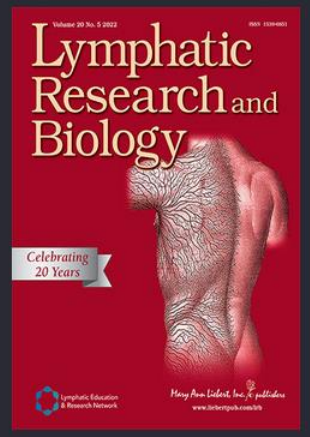


Fig. 3 Participant flow

Pilot Feasibility Stud **5**, 113 (2019).
https://doi.org/10.1186/s40814-019-0496-4

Study 2



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ARTICLE

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View article page

Nyree Dunn, Edgar M. Williams, Gina Dolan and Jane H. Davies

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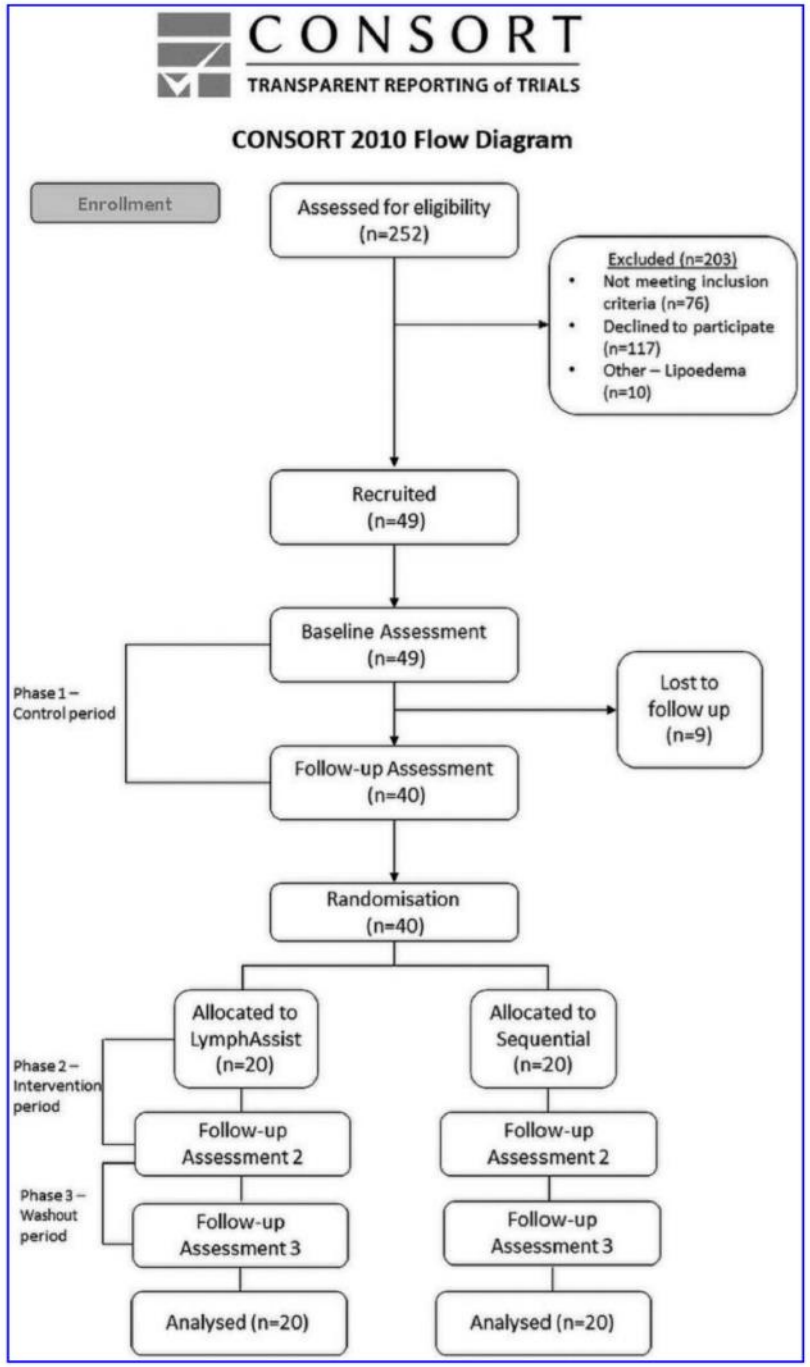


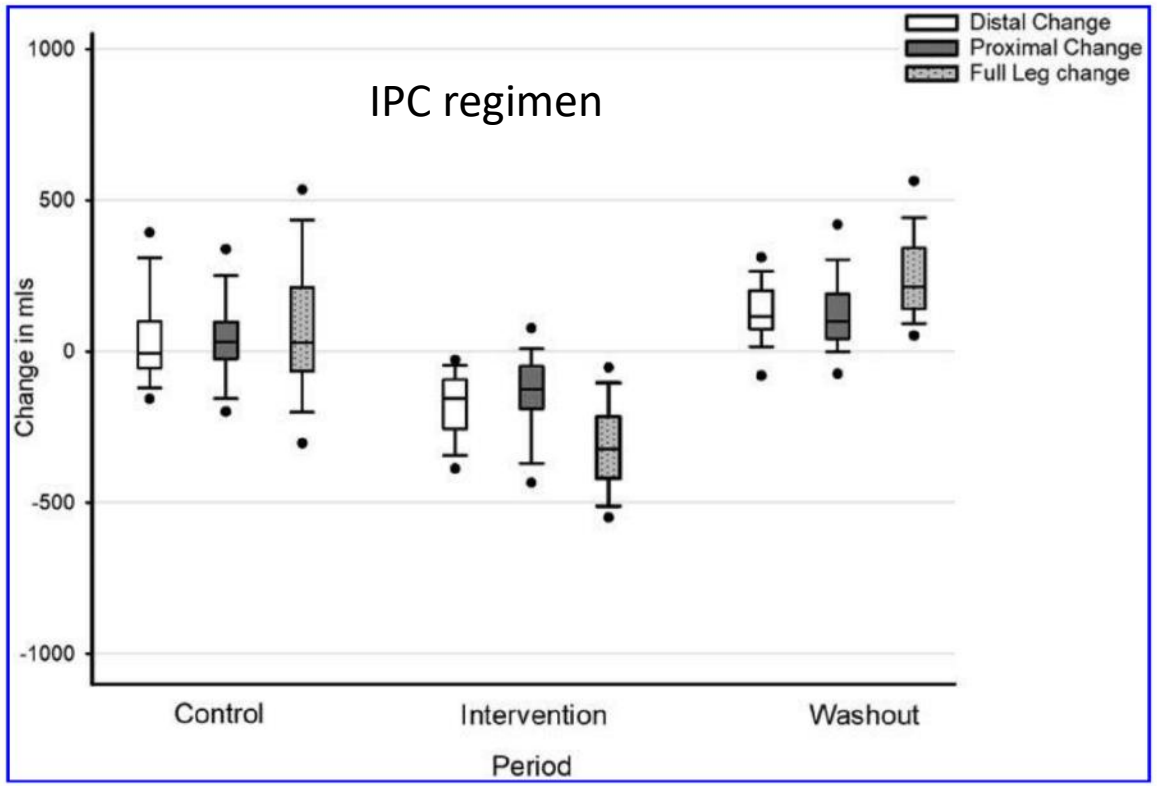
FIG. 1. Consort flow diagram/study design.

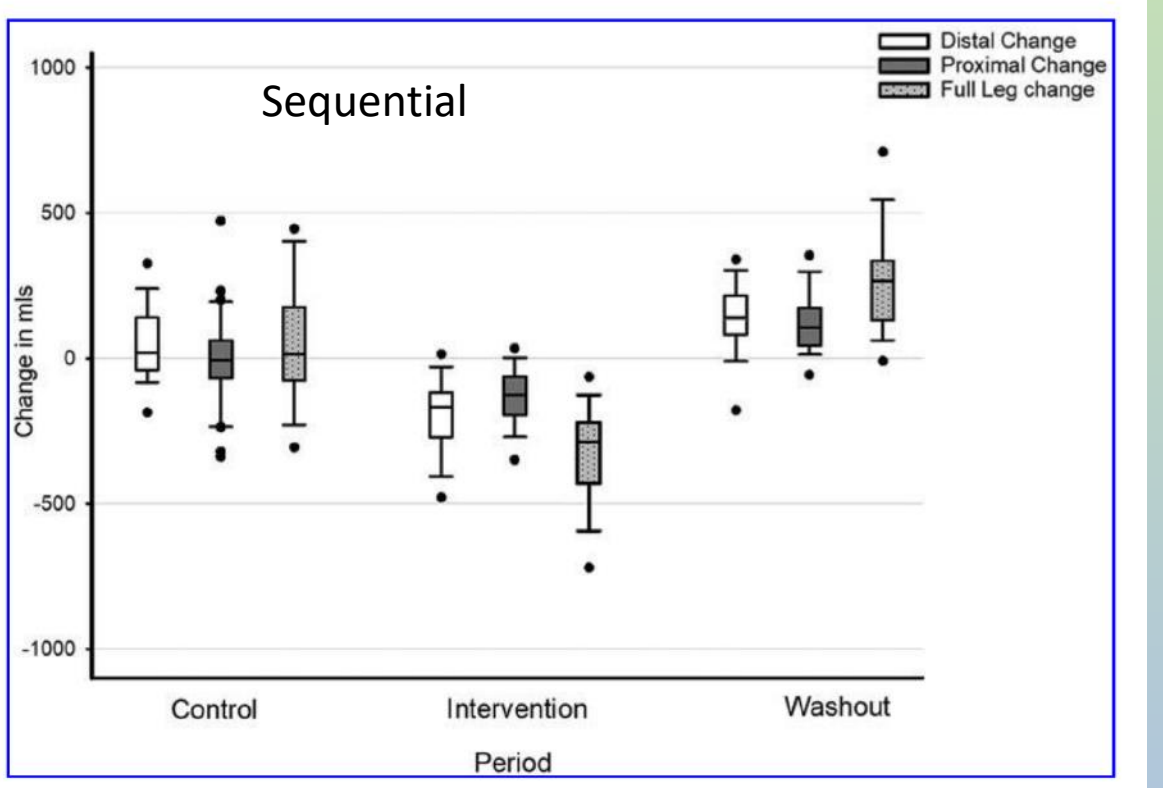
TABLE 2. POPULATION DEMOGRAPHICS AT BASELINE ACCORDING TO THE INTERVENTION GROUP

	LymphAssist (n=20)	*Sequential IPC* (n=20)	p
Age, years	61±10	60±10	0.6
Gender, F:M, %	74:26 (15:5)	85:15 (17:3)	0.4
Weight, kg	104±31	97±27	0.3
Height, cm	167±12	166±9	0.3
BMI	36±9	34±7	0.4
Stage II:III, %	80:20 (19:1)	85:15 (17:3)	0.08
Affected lymphedema volume, mL	8972±2997	8692±2710	0.6

IPC, intermittent pneumatic compression.

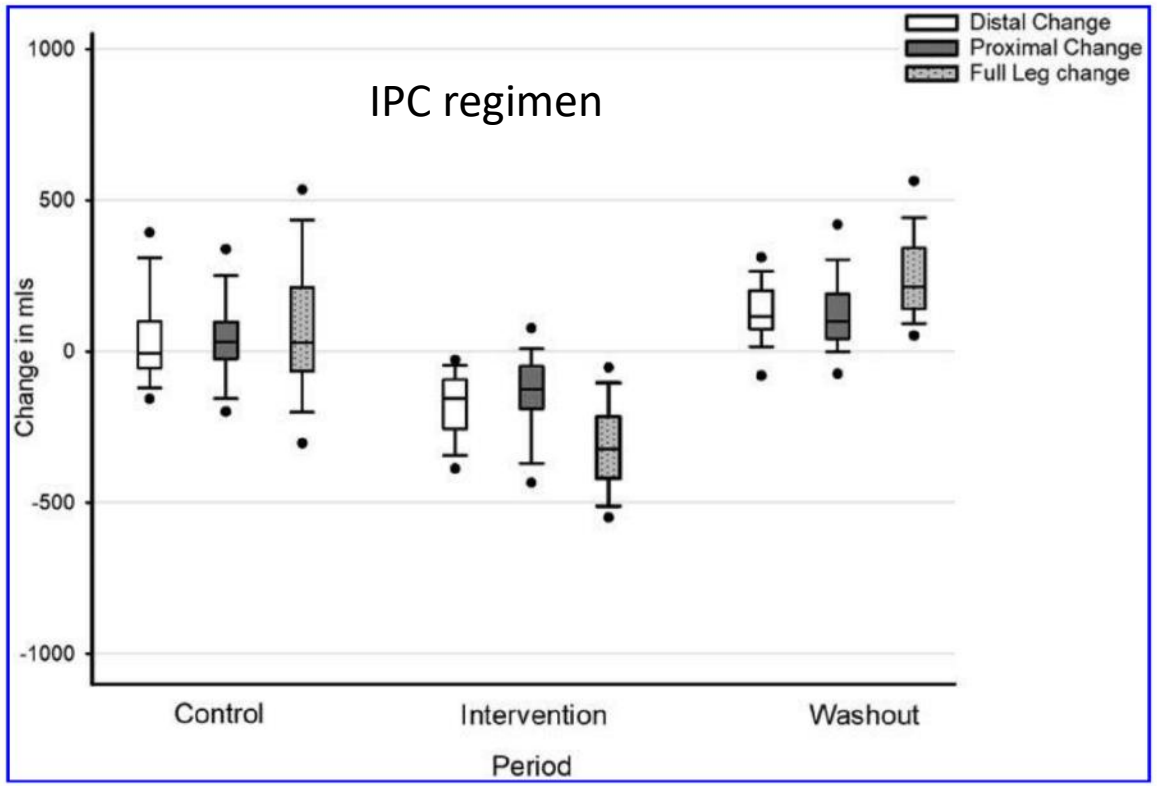
Study 3

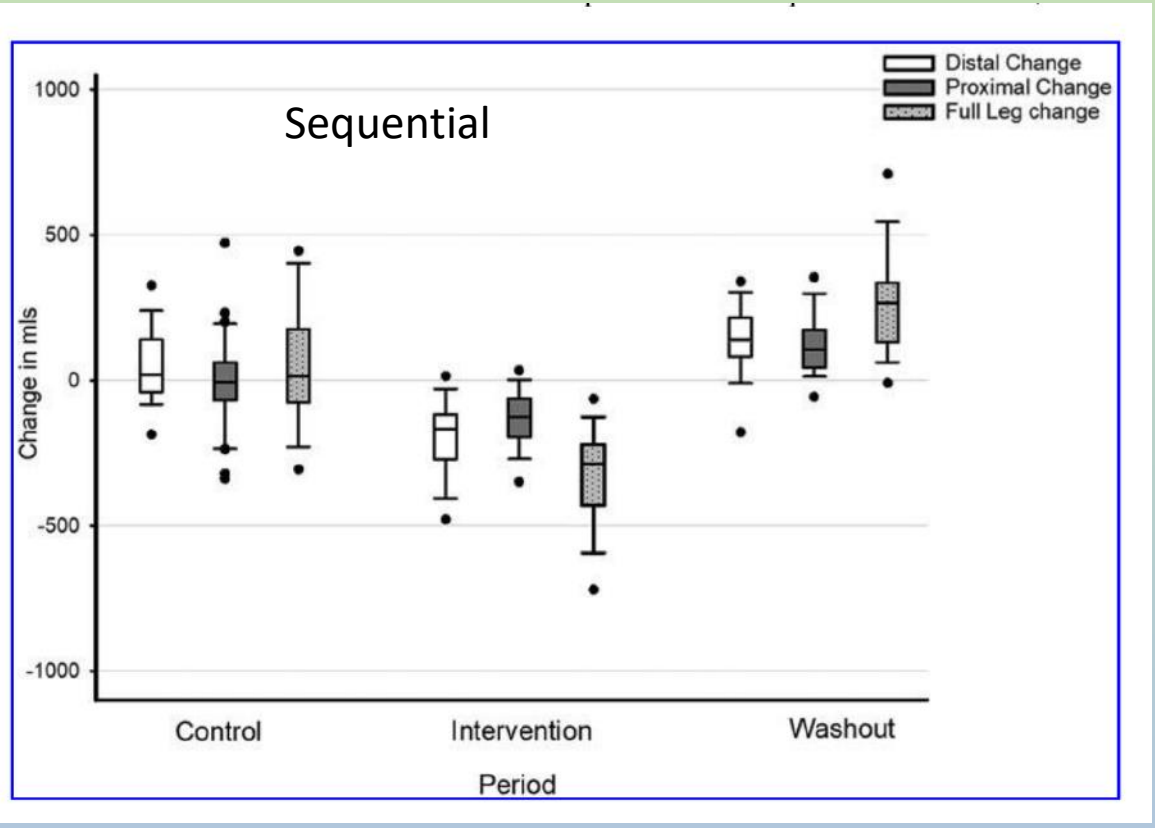




Results: The LymphAssist™ IPC regimen was significantly more effective in reducing distal leg volume than the sequential mode (mean volume reduction: 230 ± 135 ml vs 140 ± 84 ml, respectively, p = 0.01).

Improvements in leg volume were transient as both groups demonstrated a rebound increase in volume during the washout period (LymphAssist: 238 ±168 ml; Sequential 276 ± 158 ml, regimens, p = 0.3).





Conclusions: IPC (LymphAssist™) is effective in reducing limb volume in patients with lower limb lymphoedema. IPC that mimics the MLD process has been shown to be more effective in reducing leg volume compared with traditional sequential IPC in the distal leg. The subsequent increase in leg volume observed after withdrawal of IPC suggests that regular treatment is required to maintain its associated effects.

Skin Research & Technology
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ORIGINAL ARTICLE | Open Access

Skin biomechanical properties and leg volume in aging healthy adults

Nyree Dunn, Jane Davies, Gina Dolan, E. Mark Williams

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Abstract

Background

In adults ageing is accompanied by changes in limb volume and skin biomechanical properties.

Study 4

Accessory data

Lessons Learnt

1) Participant expectations.
2) Participation availability and recruitment.
3) Practical design.

4) Collaboration between academia, healthcare and industry very productive.
5) Educational component for all.
6) Working with Health Professionals and their Networks
7) Home use difficult to test.
8) Commercial drivers and research
9) Further Research

Question answered?

1. Patient : Reduces limb volume, continuous use required.
2. Healthcare: Cost effective, worthwhile?
3. Scientist: Technology assists lymph drainage.
4. Manufacturer: The instrument reduces limb volume (clinically proven).

Thank you:

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Dr Gina Dolan
Dr Jane Davies

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