

# Knithera – Lymph

**Textile Sleeve for Lymphedema Rehabilitation**

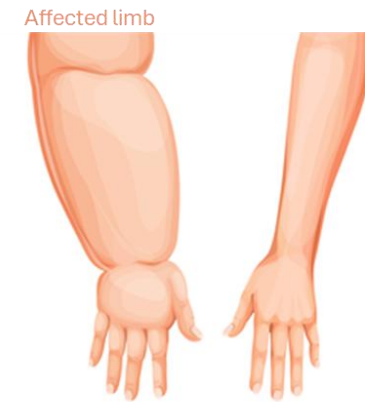
Tintex Textiles

# The Problem

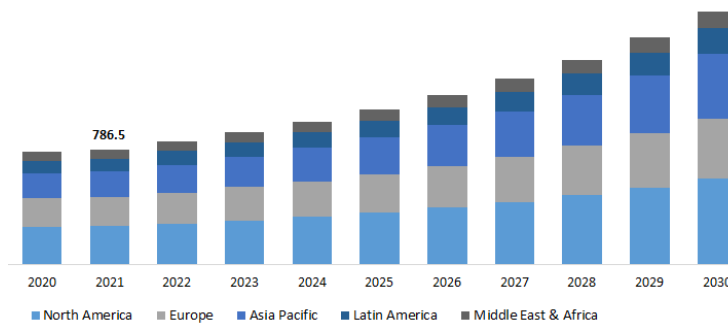
Lymphedema is a chronic condition causing localized swelling, due to a buildup of lymph fluid. It often follows cancer treatment, surgery or lymphatic injury and requires long-term management.

## Treatment (depends on severity):

- Keeping the affected area clean, hydrated, and free from infections
- Regular physical exercise
- Use of compression stockings or bandages
- Use of external pumps to aid in fluid movement throughout the body
- Laser treatments in the affected area - infrared
- **Manual lymphatic drainage (MLD)**



**250 M**  
People affected worldwide



Source: Polaris Market Research Analysis

# The Problem

## Current Solutions

### Pressotherapy devices

Bulky and imprecise  
Expensive  
No monitoring of the condition by professionals

### In-clinic MLD

Time and resource intensive, requiring patient and therapists' availability  
Efficient and reliable



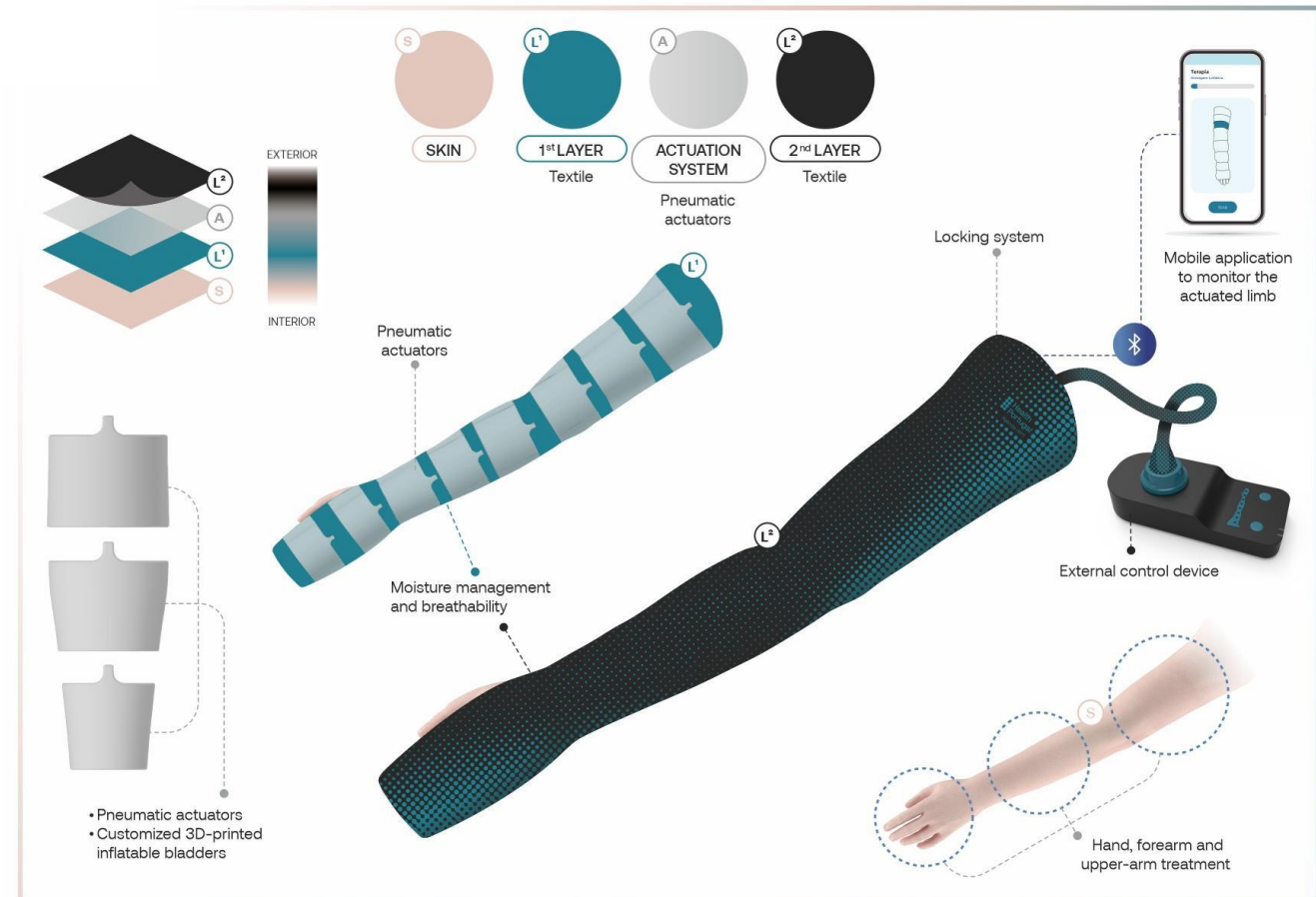
## Care Gaps

Adaptability to the condition and ergonomics of the patient  
Precise simulation of the MLD manoeuvre  
Frequency and accessibility of treatment

# The Solution

## Soft Robotic Textile Sleeve for Lymphedema Rehabilitation

- ❑ Actuation systems with pneumatic actuators, embedded in textile architecture;
- ❑ Inflatable cells mimic steps and pressure achieved in MLD based on Leduc Method performed by healthcare professionals;
- ❑ Mobile App to monitor and register procedures;
- ❑ Comfortable and breathable textile system with antibacterial and fast-drying finishes;
- ❑ Easy transportation for at home and in-clinic use.



# The Solution

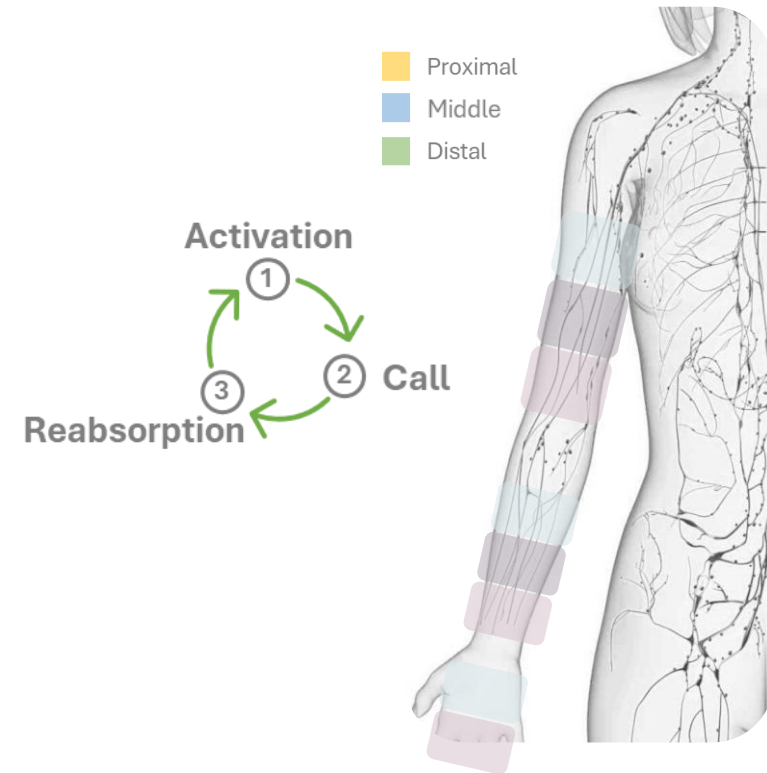


# How it works

Lymphedema **occupational therapists use slow, repetitive hand movements** to stimulate lymphatic drainage by **gently massaging** along anatomical lymphatic pathways over affected areas, based on Leduc Method.

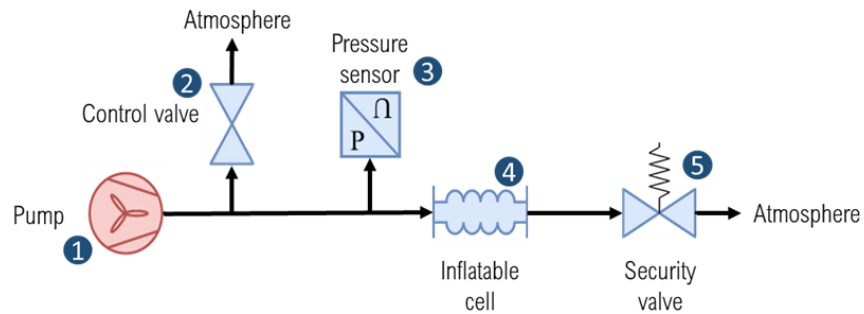


Force sensors were used to determine necessary pressure during procedure.

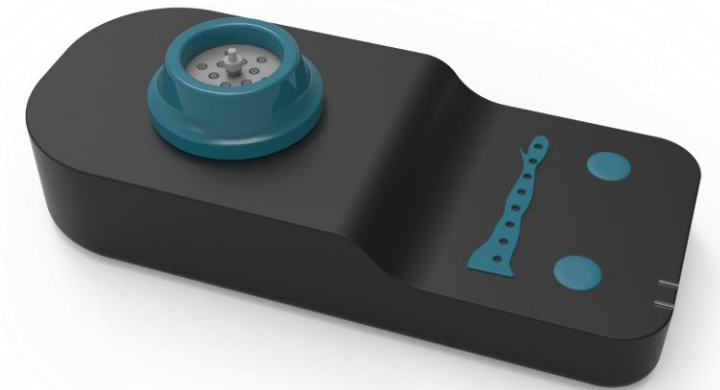
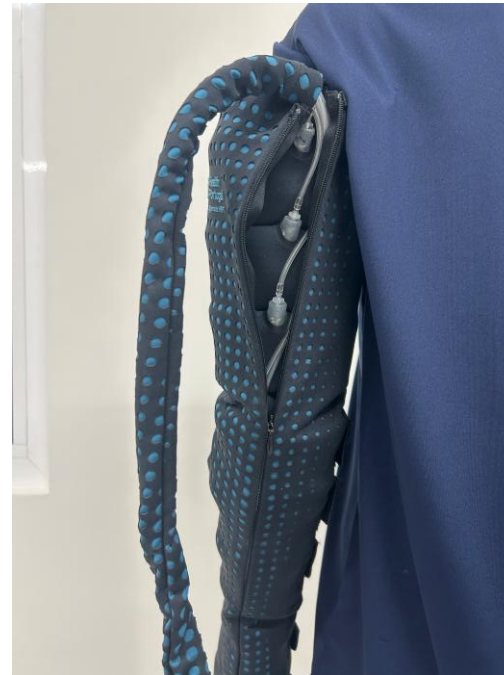


# How it works

## Actuation System + External Device



Inflatable Cell



Optimized External Device after Usability Tests

# How it works

## Textile Architecture



### Double Layer System

- Layer 1 - thermal and moisture management properties, soft and comfortable, minimizing potential skin irritation;
- Layer 2 - guarantees that the correct pressure and direction is applied by the actuation system, while maintaining the breathability of the entire product.

## Design and Production



### Integration of Inflatable Cells

Pockets with invisible zip



### Sensor Integration

Thermobonding with TPU film  
Sensors on both sides of layer 1

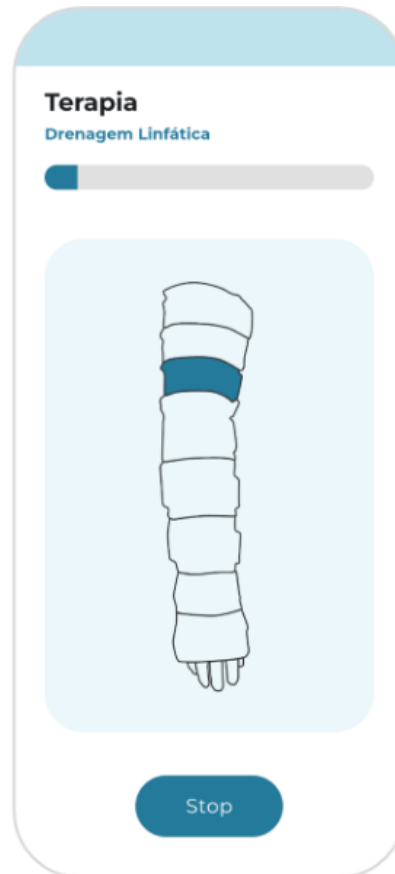


### Sleeve Adjustment Systems

Application of straps and loops

# How it works

## Mobile App



## Features

- Procedure tracker;
- Procedure live monitoring;
- Session calendarization and notifications;
- 2 modes: lymphatic drainage and pressotherapy.

# What makes it different



Personalised rehabilitation solution for lymphatic drainage



Adjustable to limb's measurements



Mimics Leduc's Method - Consistent and Repeatable therapy



Textile-based design ensures comfort, adaptability, and breathability



Validated by healthcare professionals

**Patient Autonomy**

**Lower health system strain**

**Digitalization of Patient Care**

# Market Strategy

## Production Scale-up

Produce 50 sleeves for next phase

## Clinical Validation

Partnerships with clinics to test and validate the product  
→ on-going

Initiate medical device certification process

## Licensing

License technology or product to interested partners



Investment is necessary

# Development Team

## Textile Industrial Partners (Tintex Textiles)

Advanced textile design, manufacturing scale-up and quality systems; track record of commercialization of disruptive products.

## R&D Centers (CeNTI/CITEVE/IPCA)

Soft robotics, embedded electronics, prototyping, testing and device integration.

## Clinical Partners

Therapy protocol definition, patient pathway validation and pilot deployment.



We are here

## Business Partners

Medical device certification planning, fundraising and go-to-market execution.