



**Project A: HFAD for  
Ambulatory MS**

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# **StrideAssist. Stride in style.**

Setting a new standard in assistive orthotic devices. Easy to wear. Easy to style.

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**2026 Final Project →**



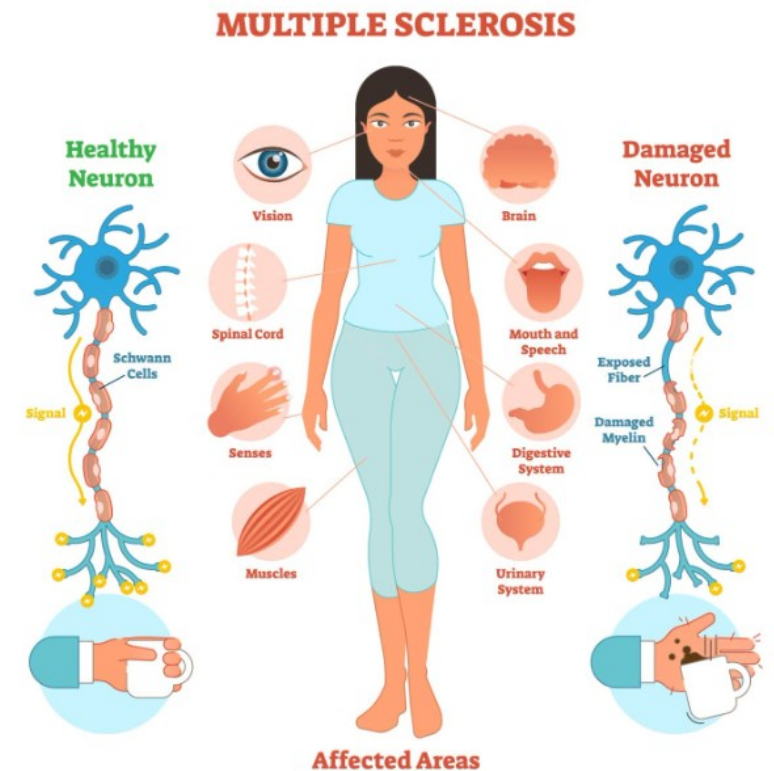
# Multiple Sclerosis (MS): *Causes the body's immune system to mistakenly attack the central nervous system (CNS).*

## 1. Early-stage or Relapsing MS

- a) Immune cells incorrectly target and damage the protective lining of nerve cells
- b) Causing slowed, disrupted, or blocked neural communication
- c) Symptoms phase in and out, with longer symptom periods

## 2. Progressive MS

- a) Axonal and neurological damage continues beyond the protective coatings and causes permanent damage
- b) Can lead to wheelchair use and bedridden patients
- c) Continuous symptoms and no relapse



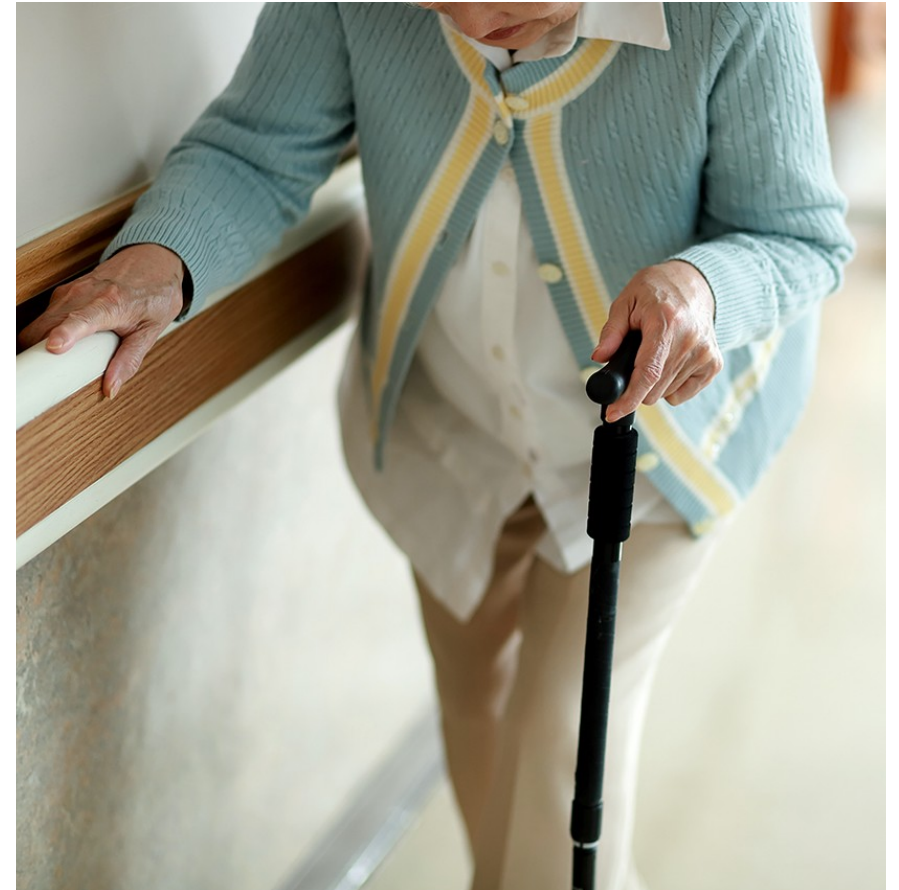
## Where Do We Fit? Patients with MS experiencing difficulty walking.

### Patients who physically

- Experience minimal drop foot
- Can stand independently
- Able to push/pull 50lb resistance bands while seated

### Patients who would like to

- Stay fashionable
- Receive gait assistance
- Increase independence



## — The Current Market

# BraceWorx: Hip Flexion Assist Device

### What we want to keep

- Supportive waistband
- Sufficient tension provided by rubber bands

### What needs to change

- Complex and difficult set-up experience
- Requires extensive donning and doffing procedure
- Cannot fit under clothes
- Uncomfortable to wear



“Who the fuck would design something like this.”

-Kathy  
(paraphrased)

**A way to assist gait mechanics in patients with ambulatory MS that increases user compliance with hip flexion orthosis.**

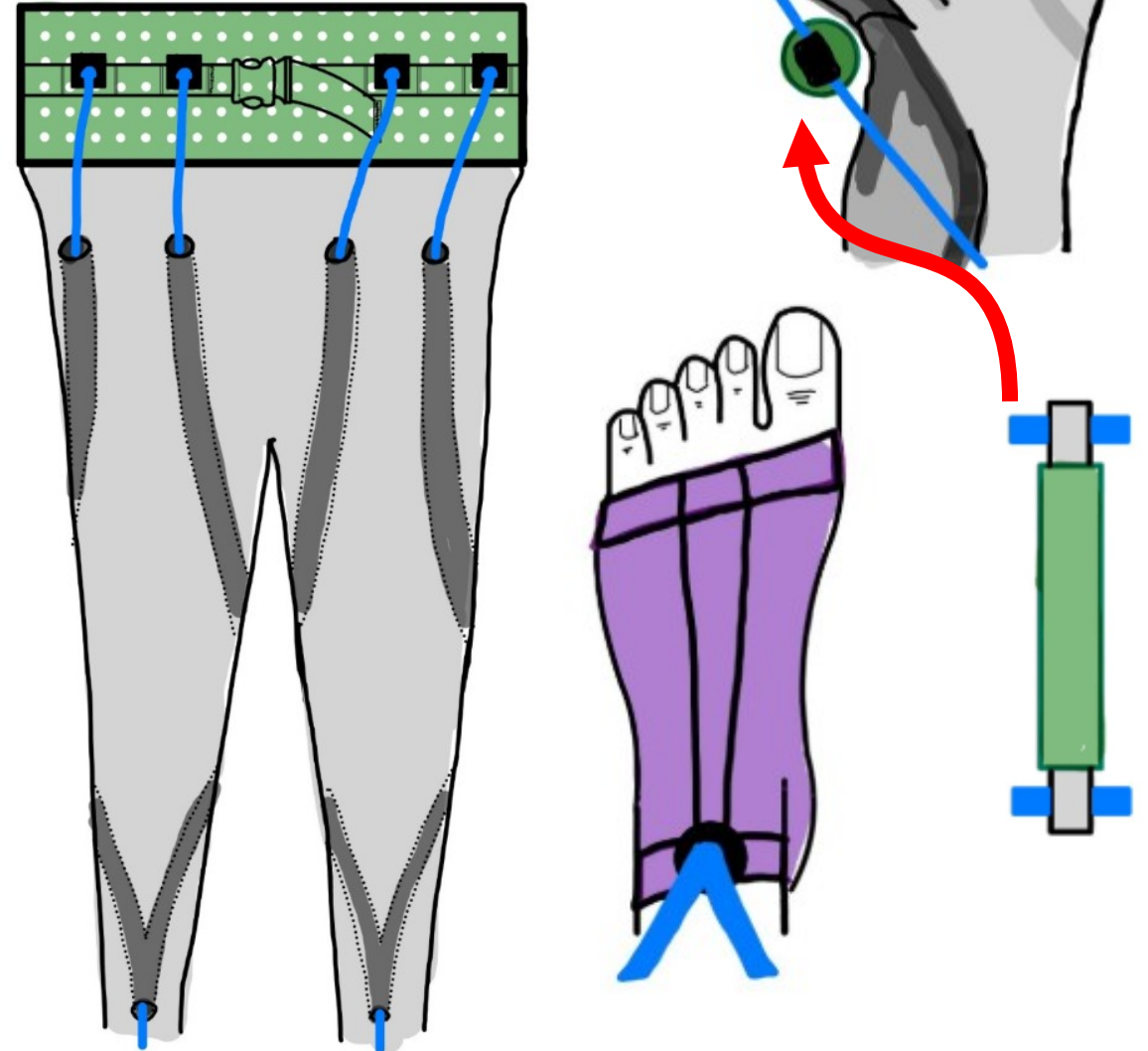
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— StrideRite: The Solution

# Raising the bar with no bar

## Our Proposal:

- Easy-to-use
- Visually anonymous
- Form-fitting tights
- Match current device functionality
- Increase patient compliance.



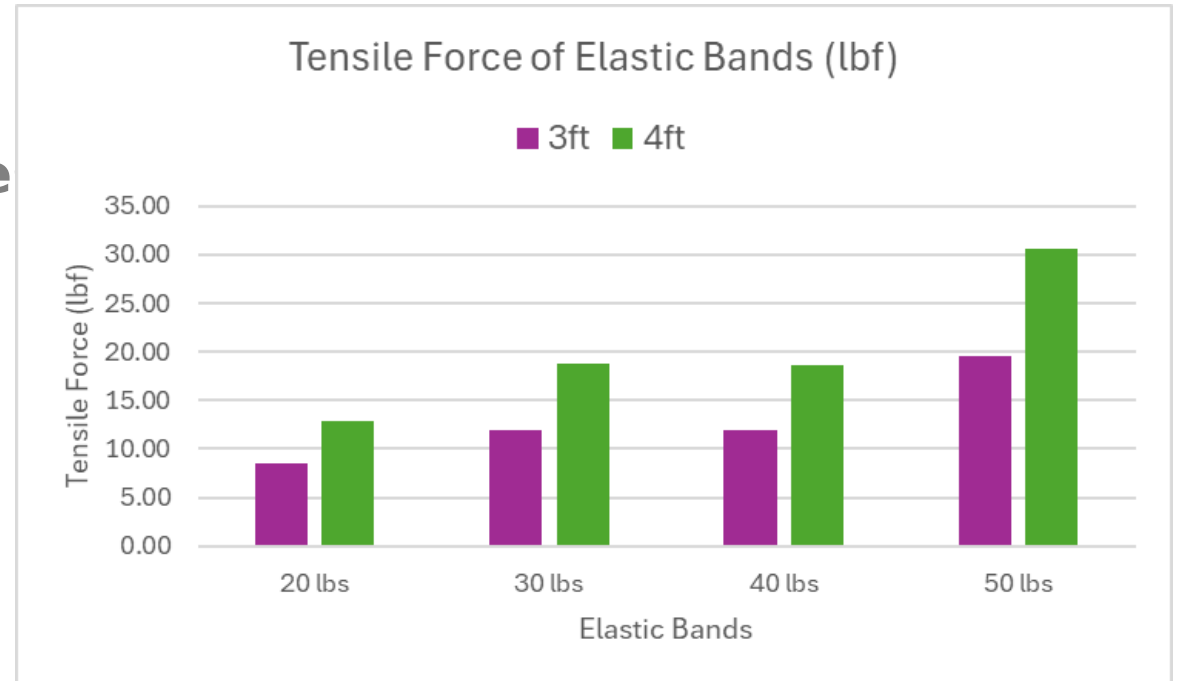
# Product Specifications:

## Device Specs:

- Size Ranging (XS → XL)
- Device weighs < 5 lbs
- Ability to wear with regular shoe
- < 5 min to don or doff
- Lasts ~200 days

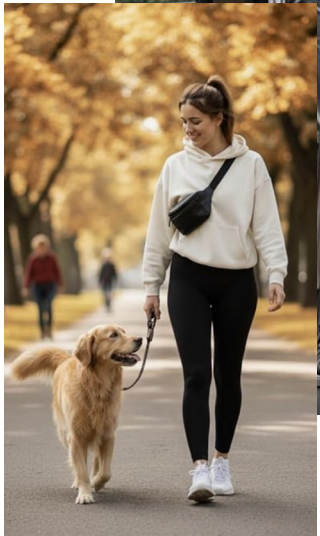
## Tension Band Specs:

- Interchangeable tension bands



Avg tensile force per 3 trials.

# The Prototype



## Key Features:

- Easy to put on and conceal under everyday clothing
- Ankle supports fit in shoes
- Washable
- High-tension flexible bands

## — THE ADVENTURE

### **Fabrication was informative with some minor hurdles...**

**Chosen material design exceeded current device capabilities and creator expertise.**



Threads frayed



Needles broken



Tears and blood shed

**Prototype materials impeded full completion.**

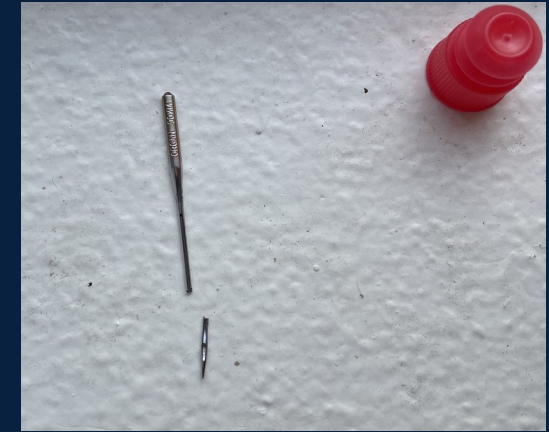
The belt needed to be stiff while tights needed to be stretchy.

Prefabricated leggings prevented band coverage in the prototype.

**Experienced consultants saved the day.**

Consultations with more experienced sewists Mrs. Hageman and Dr. Shauna Dudley-

lavoroski helped achieve device completion



“How the fuck did that happen.”

*-Maddie*

*We tried our best and thankfully had kind and reliable collaborators.*

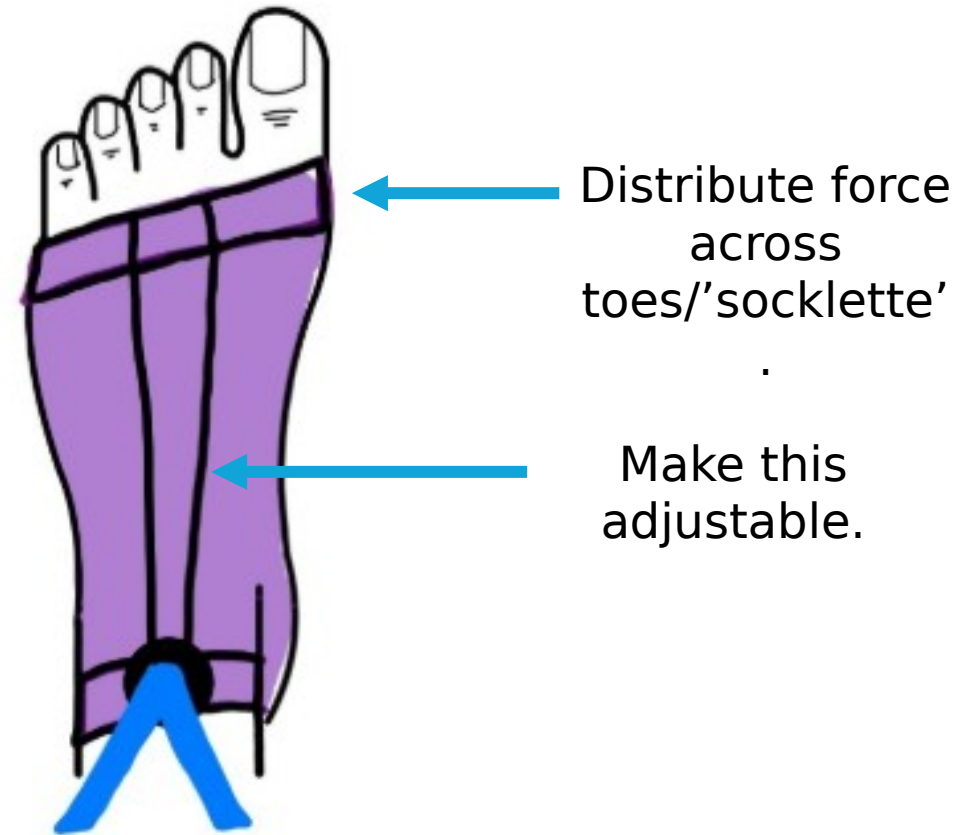


# Future Iterations and Manufacturing

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## Improve current difficulties:

- Add 'channels' to legs to hide rubber bands
- Distribute force across a wider foot area
- Offer a variety of styles and fits for users



— QUESTIONS?

# Thank you!

