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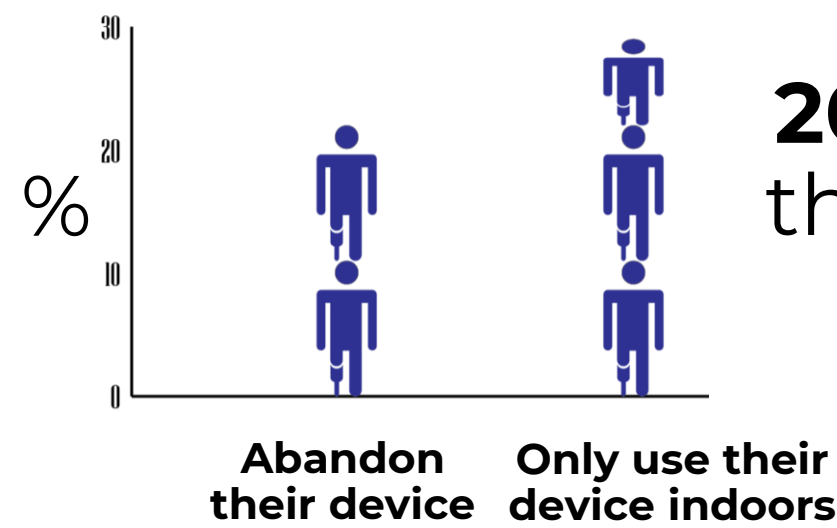
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1. The Problem

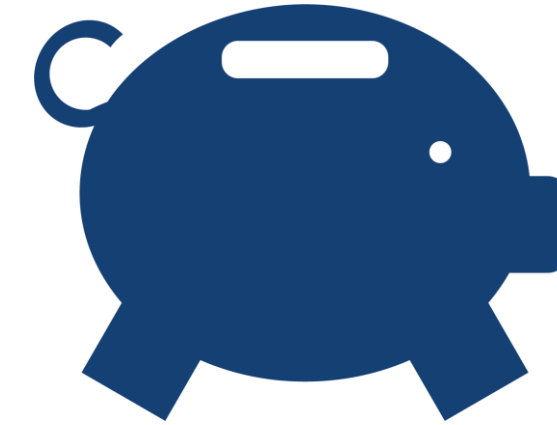
63% of people with **lower limb loss** report having one or more **skin injuries**¹, resulting in **device abandonment**¹, a **decrease** in **social inclusion**² and a **decline** in **mental health**³



95,000 amputations 2003-2013⁴



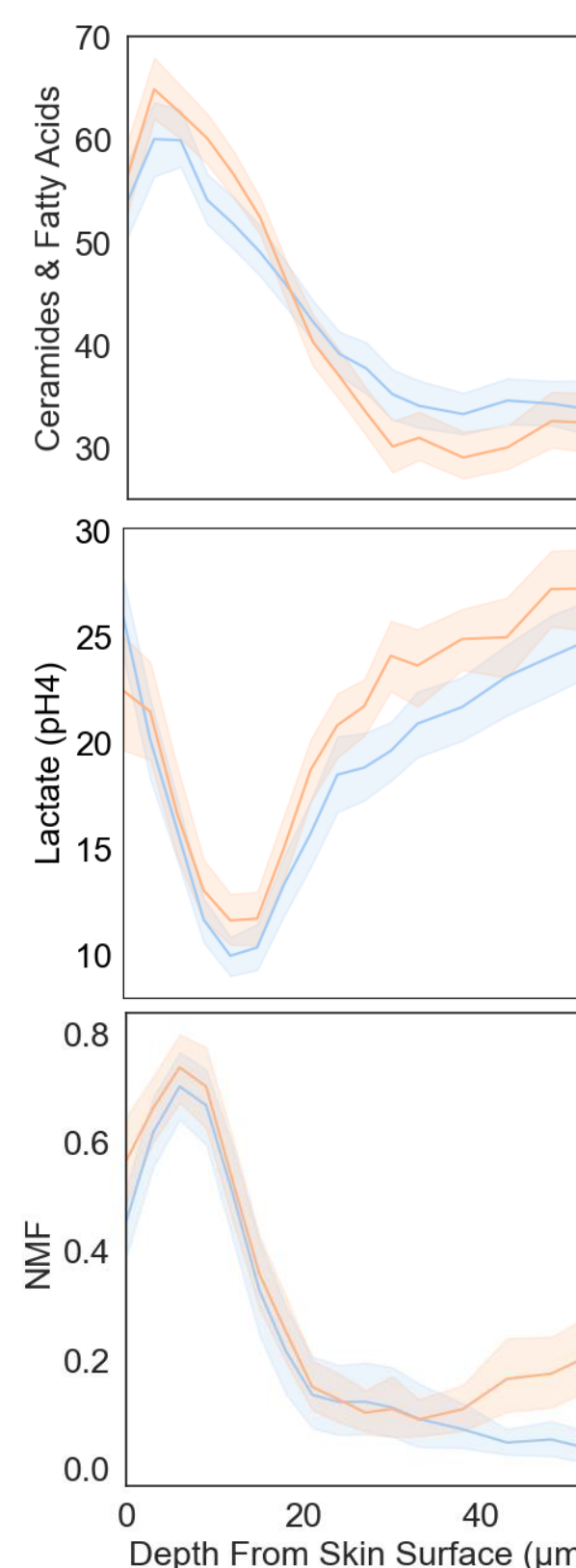
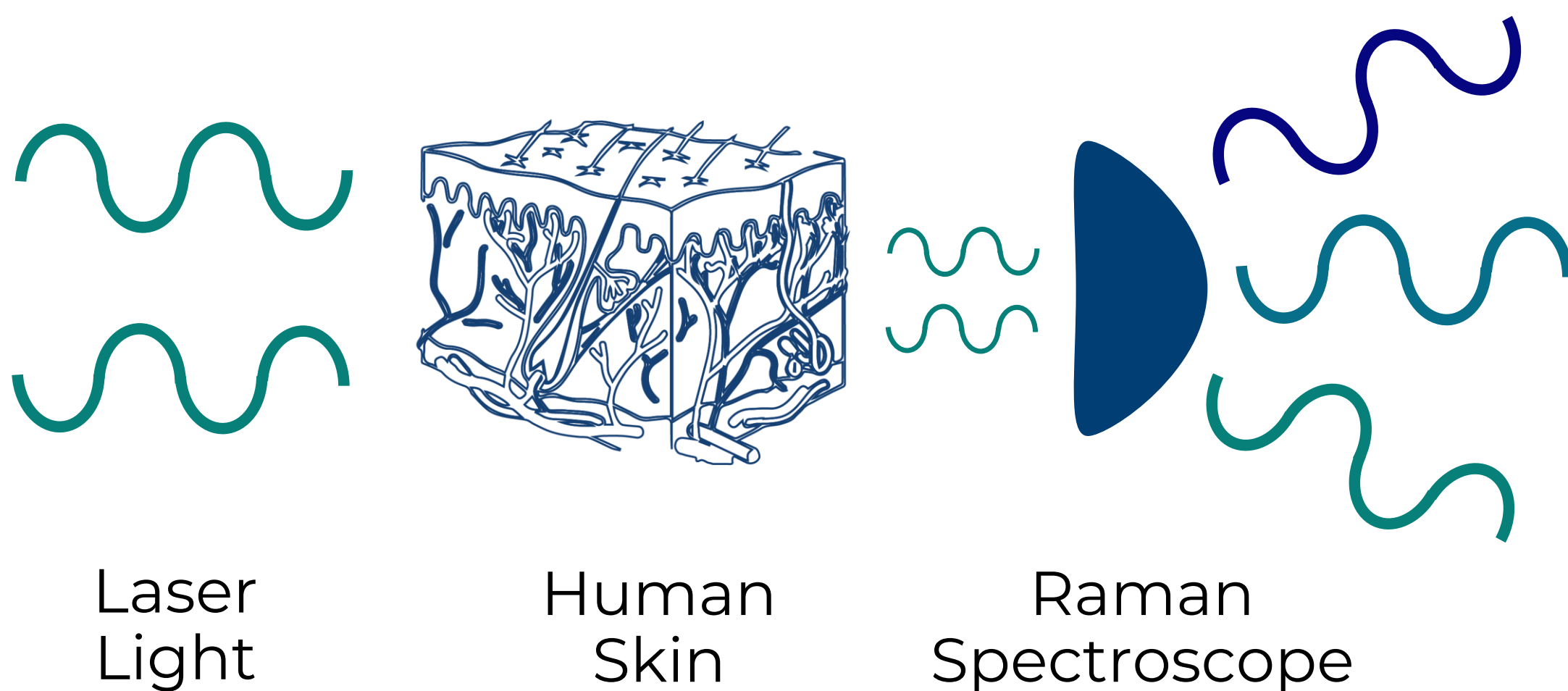
20% stop using the **device** after **just 1 year**¹



NHS: £1 out of **£150** spent on **diabetic amputation**⁵

2. What did we do?

Using **Raman spectroscopy** and **physical characterisation** we assessed **amputee skin** and **compared** this to **healthy skin** aimed at **reducing** skin **injury rates**



Fatty acid very **consistent** between skin sites

Lactate **Increased** level at the skin surface in **amputee** skin

Natural Moisturising Factor **Decreased** level at the skin surface in **amputee** skin

3. What did we find?

1. I identified that **skin characteristics** show **strong change** to **prosthetic use**, whilst others **do not**

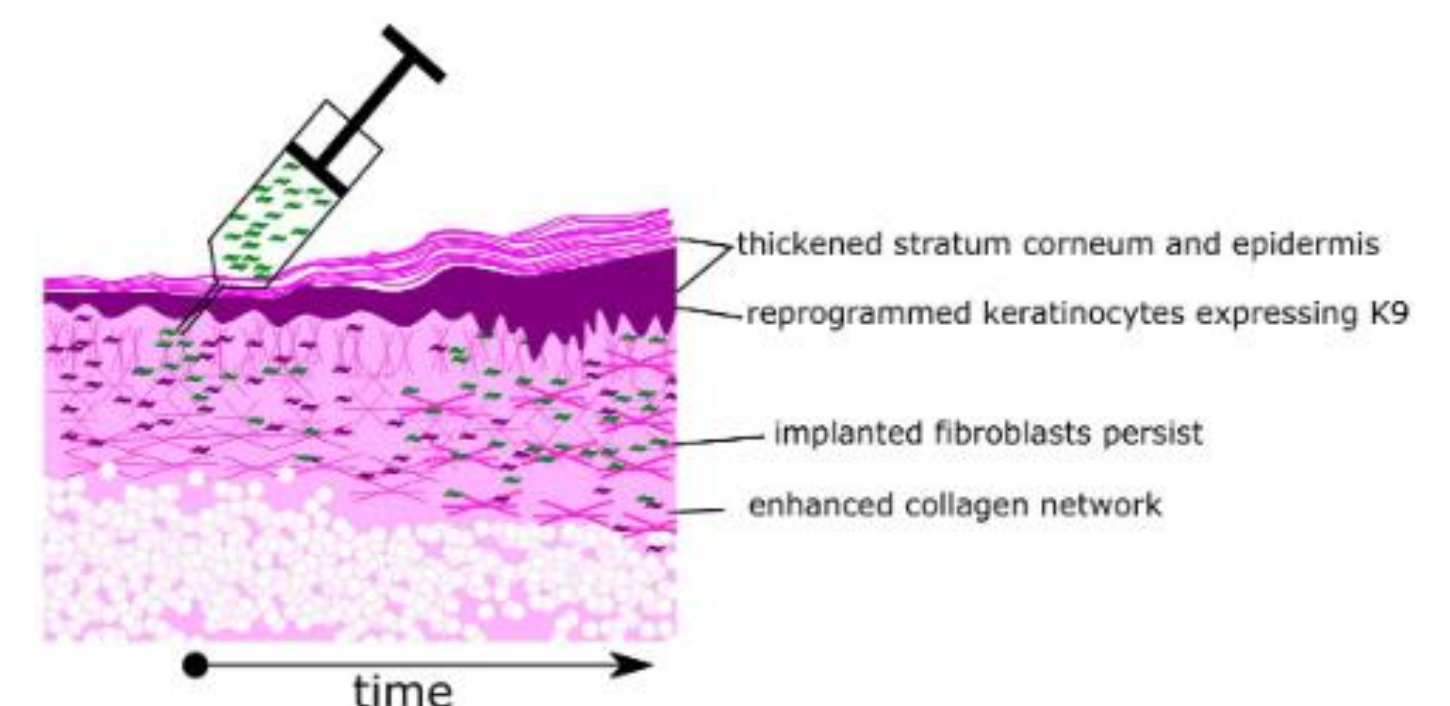


2. **Hydration levels** and **skin thickness** are **very similar**

3. **Stump skin** is **much softer** and is also **less slippery**

4. The Impact

My current results highlight a **need** for a **new approach** to **prevent skin injury**. **Plantar Reprogramming** will improve the **resilience of amputee skin**, facilitating **rehabilitation** and improving **quality of life** and **reducing cost** to the **NHS**



5. The Next Steps

- Continue **testing skin resilience**, linking mechanics and biology across the scales
- Test the **validity** of **tissue engineering** to increase **resilience** of skin using **plantar reprogramming**
- Scale-up therapy towards a small clinical trial