Brunel University London

Design for Health

SimLevator

Collaborative Project 2023-2024

A clinical simulation device to improve the ethics, safety, and quality of intimate pelvic floor examination learning.

Clinical Leads

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NHS Foundation Trust

The Challenge

Design for Health

Pelvic floor examinations are intimate assessments used to evaluate the strength and function of the pelvic floor muscles to diagnose and treat pelvic floor dysfunction. Conducted by Pelvic Health Physiotherapists, these procedures necessitate a keen understanding of not only technical examination skills and pathology recognition, but also clear communication for patient consent and comfort. Currently, training for these intimate assessments internationally relies upon a technique called Peer Physical Examination: where students practice practical examination skills upon one another.

Existing simulators fail to accurately represent visual, anatomical, and most crucially, dynamic muscular anatomy, and therefore cannot teach correct muscular examination technique. Additionally, pelvic health physiotherapists can only establish a baseline diagnostic criteria through on-the-job experience, running the risk of misdiagnosing initial patients.

As of 2016, there were only 700 registered pelvic health physiotherapists treating the entire country. This number is massively insufficient to serve the population, particularly as awareness and prevalence of dysfunction increases. Recognising this, the NHS has put forward a co-ordinated strategy to meet this increasing demand- ultimately necessitating the widespread education and training of practitioners in the pelvic health specialism.

Product Requirements

• The product will provide a comprehensive pelvic floor assessment for students (external and internal palpation)

• The product will replicate the realistic movement of the pelvic floor muscles

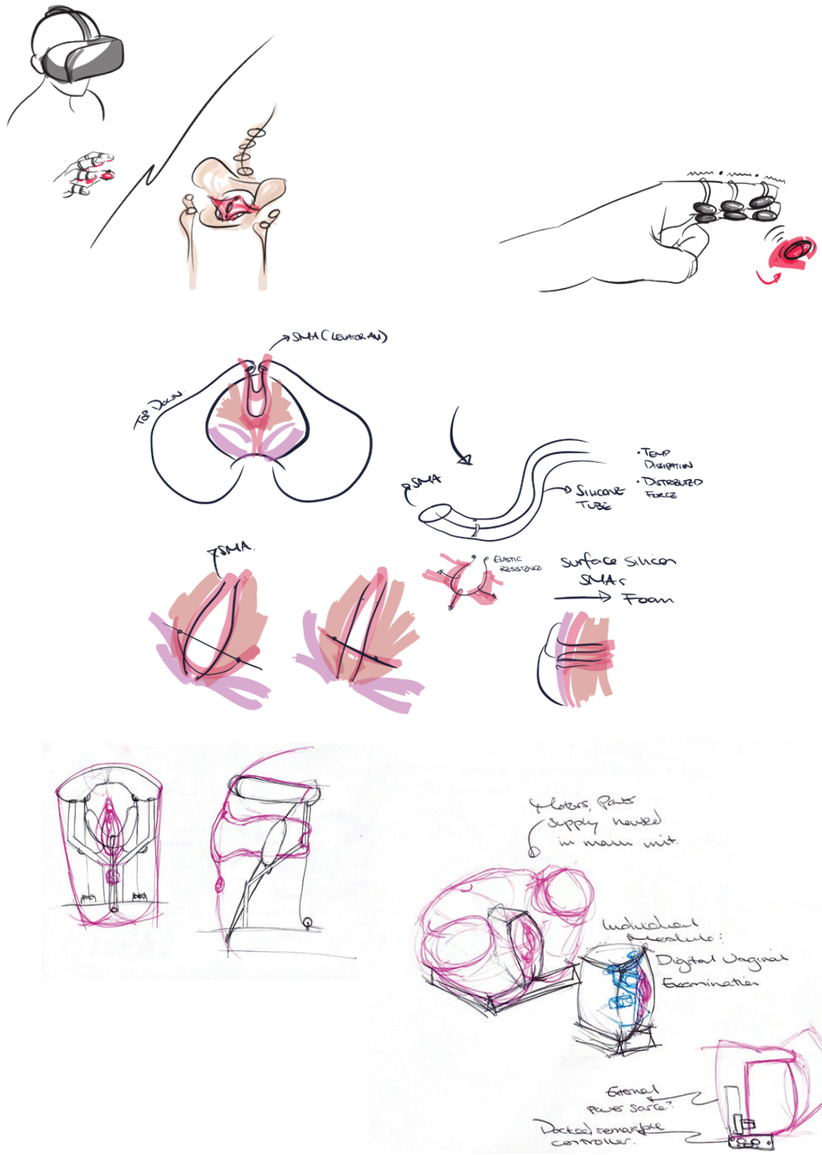
•The product must present at least 3 discrete baselines for muscular tone (Increased, Decreased, Normal)

•The product will teach students to recognise symptoms of pelvic floor dysfunction

• The product must allow for realistic visual and digital assessment of the perineum

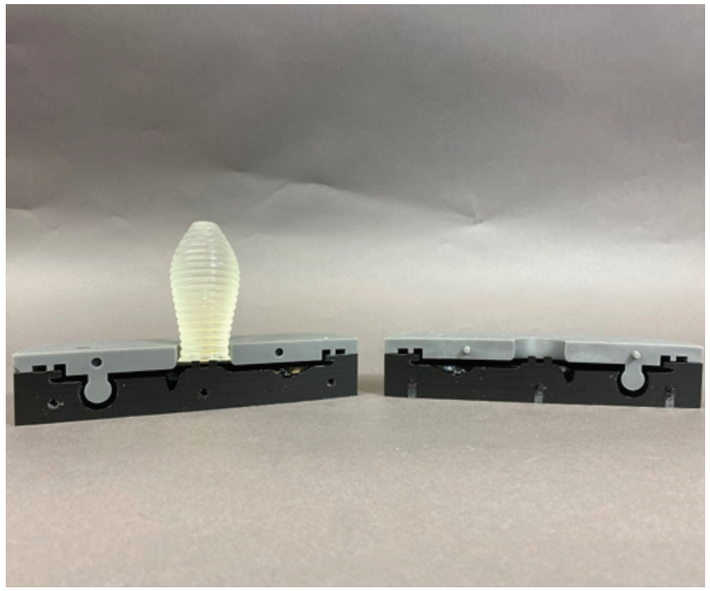
Ideation and Development

Ideation and iterative concept development

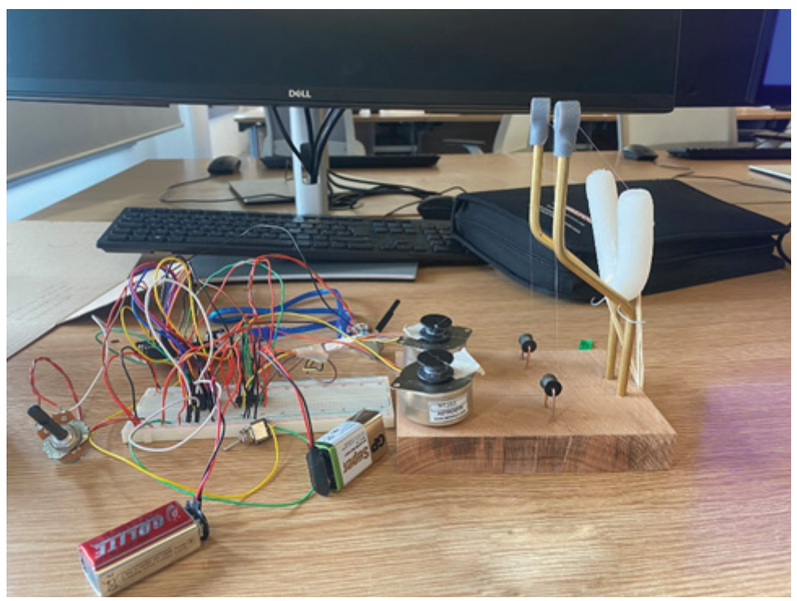


Ideation and Development Cont.

Silicone mould development to create realistic anatomical model



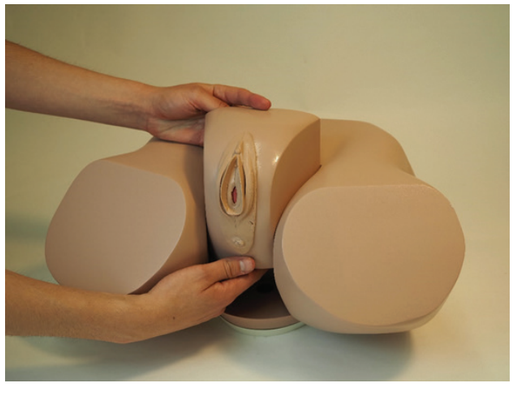
Electronic development to simulate pelvic muscle tone and contractions



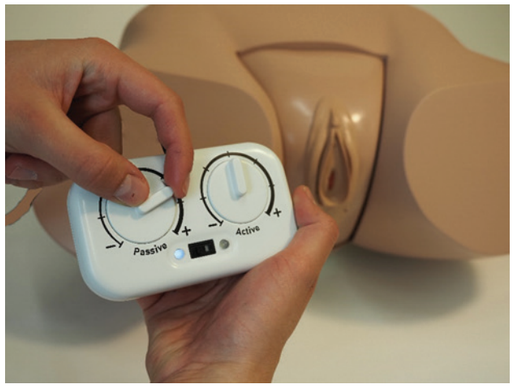
Final Prototype

The final design is visually accurate, haptically realistic, and functions dynamically through a contraction cycle, and can be controlled to represent a range of muscular tonal pathology.

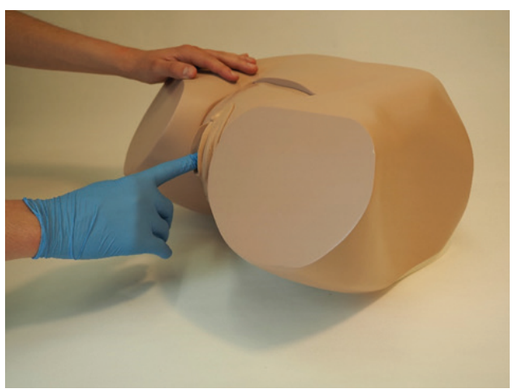
Final Prototype Cont.



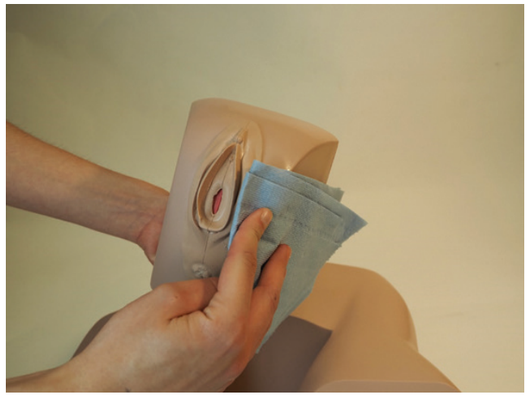
1. Insert module



2. Set muscle tone



3. Conduct training



4. Switch for contraction

5. Clean and store