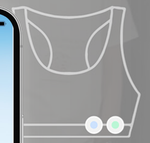


VIBRA NeuroTech

Timeline
3 months

Team
Research: Christina Yang & Yang Hu
Model Generative: Christina Yang & Yang Hu
UI Design: Yang Hu
Model Testing: Christina Yang

Inspiration

One of my favorite Chinese female singer: Beina Yao, died of Breast Cancer a decade ago. Since then, I have been laid my eyes on this disease which represent 15.3% of all female cancer cases.

It' s has been noticed that, with higher recovery rate from this type of cancer thanks to advanced medical development, there' s not enough attention paid on the aftercare for Breast Cancer survivors.

23% of today' s cancer survivors are female Breast Cancer survivors. It is a large group of people that I could not take the attention away. Based on this, the research has been initiated.

RESEARCH: Scoping Framework

First, we created a territory map to better understand the complex yet interconnected Breast Cancer, rehabilitation system, and design opportunities were identified. The territory map helped us scope the project and get consensus between team members.

We put the patients at the center of this diagram because of their frequent interactions with stakeholders.

As our research progressed, we further focused on **Breast Cancer survivors** after surgery **with lymphedema** and the caused-side-effects on **yoga rehabilitating practices.**

60% of the Yoga Practitioners surviving from Breast Cancer report shoulder-arm pain triggered by lymphedema.

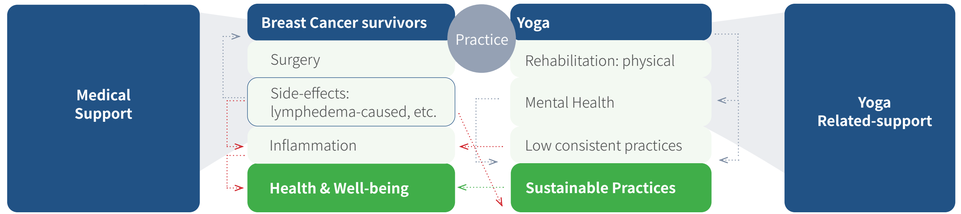
Breast Cancer survivors

Yoga Teacher

Doctor

EXPLORATION: Analysis & Surveys

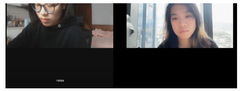
Analysis



Interviews and Surveys

During the exploratory research phase, we conducted interviews& online questionnaires.

Interviews helped us better understand the problem space and identify design opportunities, which helped us to build up sympathy mapping with more insights.



For more details, please view here:
https://drive.google.com/drive/folders/1fVi_r6S-G3u9T3D971MdUvSwS9h7AOcJ?usp=sharing

Breast Cancer Survivor

Questionnaire+Interviews (n=5)
- Google form survey
- Residents in apartment

Yoga Teacher

Interviews (n=3)
- Baidu Online chat
- Kamo Yoga

Medical Professions

Questionnaire+Interviews (n=5)
- Baidu Online chat
- Biomedicine student

Negative Side-effects from Surgery Effect Consistent Yoga Practices

Yoga Classes	Privacy	Community	Fatigue	Mental State	Guidance
Group Class Yoga	Unwarranted, not confident to be involved	Responsive Q&A, sharing..	When difficult to be involved & follow	When difficult to be involved & follow	Unresponsive guidance
Private Class Yoga	Yes	No companion while teacher is supportive	When concern about the cost	Expensive cost	Individual needs
Online Yoga Classes	Yes	Responsive Q&A,sharing..	Surgery related fatigue & no	Might do it wrong without responsive	Unresponsive guidance

What's on the market for sustaining Yoga practices for Breast Cancer Survivors

We also conducted the in-depth literature review and market research to understand the recent design and technology trends in:

1. Pain control/alleviation caused by surgery, especially focusing on lymphedema.

2. Yoga-related platform/products

TYPE OF PRODUCT
- ENTREPRENEUR
- COMMON METHODS
- LITERATURE: CLINICAL TESTED

Lymphedema-cased & Shoulder-arm Pain Control during Yoga Practices

Compression Garment | Whole Body Vibration | Local Body Vibration | Medication

Method	✓	✗
Compression Garment	**Maintain limb volume** in the affected area during different stages of treatment	• **Uncomfortable wearing** during sports • **Easily sweat: negative**
Local Body Vibration	• **Portable vibrators** directly over the muscle belly • Neuromuscular adaptations for **long-term durability & strength-gain**	More tests are needed
Whole Body Vibration	• **Reduce musculoskeletal symptoms** • **Cooperate with exercises** plan&proven to reduce pain& stress	• Prohibitive **cost** • **Non-portability** • **Inability to directly target** a specific muscle group
Medication	A common treatment	Costy

("Breast Cancer Arm Sleeves - medi USA", 2022) (de Sire et al., 2021) (Souron, Besson, Millet & Lapole, 2017)

Yoga Products

Keep App | Digital Jalebi | Pivot | iBreve | Pocket Yoga App | Liforme | Movement For Modern Life

Four insights were identified during this stage:

1. Smart wearable devices
Majority products are designed as wearable to be more convenient
2.Pose-tracking
agents as Apps, yoga mats or screenings
3.Yoga classes planning
apps enable personalized planning based on individuals
4. No curated platform for Breast Cancer survivor special needs
5. Vibration Stimuli potential

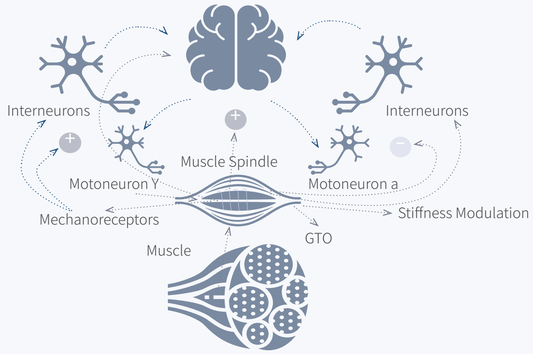
Research Case Study: Local Vibration Therapy

Local Vibration Therapy has been mainly used with healthy participants.

With case studies on Local Vibration Therapy which is scientifically proved to be a potential intervention for **alleviating shoulder-arm pain** triggered by lymphedema for Breast Cancer Survivors, with **missing products on the market**, we decided to focus on it.

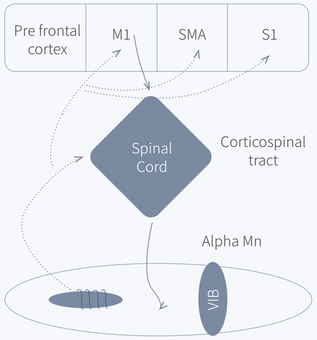
Paper 01:

The principle of vibration is ascribed to tonic vibration stretch reflex, a specific involuntary reflex mechanism induced by the fast changes in the length of the muscle-tendon complex.



(de Sire et al., 2021)

Paper 02:



Muscle Performance

- Increased isometric MVC
- No changes in dynamic MVC
- No changes in rate of force development
- No changes in walk test performance

Neural adaptions

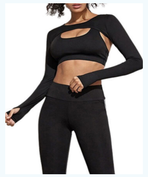
- Increased EMG
- Increased voluntary activation
- *Increased cortical activation*
- No consensus for spinal excitability
- No data for intrinsic motoneuronal excitability

Based on pain points and creative ideas emerged in sympathy maps building, we went through design iterations and user journey involving storyboards.

The storyboard was useful in helping user-testings and critique the concept during speed-dating. The feedback became much more concrete and actionable. We then extracted pros and cons.

Yoga wear with Local Vibration Module

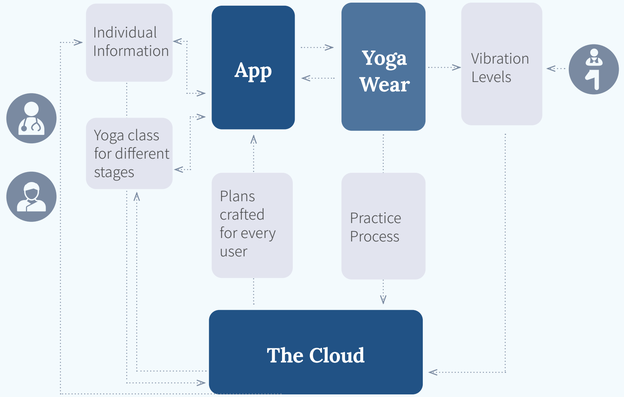
+ Vibration level is adjustable
+ Portable, comfortable to wear during yoga



A Integrated Responsive Program

+ Planner for yoga rehabilitating practices based on individuals
+ Lineage platform for practitioners, doctors and yoga teachers
+ Platform to provide responsive support for yoga guide

Systematic Diagram



Concept

Vibra Neurotech

We wish to empower health & well-being of Breast Cancer Survivors through sustaining yoga practices.

Through **alleviating shoulder-arm pain** during yoga rehabilitation caused by lymphedema from lymphadechotomy, we wish to **sustain the consistency of yoga practice** to positively intervene survivors' **motor skills & mental health**, in order to ultimately improve&empower the **health&well-being of breast cancer survivors** with yoga activity.

Goal
EUU Model

Emotion

Reduce worries caused by uncertainty & lack of support

Usability

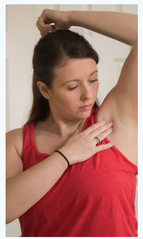
1. Improved accessibility of professional planned yoga practices
2. Sustain yoga practices by providing plans, community support & pain-controlled support

Usefulness

Integrated platform for target audiences & related medical professions, yoga tutors

Target Audience

Breast Cancer Survivors
After lymphadechotomy
Ready to process rehabilitating recovery



Persona 01

Zihui Yang
Age: 45
5 months after lymphadenectomy

Persona 02

Huiwu Zhang
Age: 56
8 months after lymphadenectomy

Persona 1

"Private class is too expensive while the teacher is really professional and patient. It worries me much that I am in the wrong poses when practicing alone."

Zihui Stage

	one month	two months	4 months	6 months & above
Behavior	• Strong pain • Can' t manage daily stuff • **Lie on bed**	• Start to operate daily stuff • **Look for rehabilitation**	• Sign up for yoga classes in a yoga center nearby • **Planning**	• **Regular check with doctor** • **Yoga classes cope with recovery**
Pain points	**Reliable** • **Unstable mental state** worrying recovery process	**Supportive** • **Rehabilitation in hospital** is **time-consuming**	**Accessible** • Private classes **cost high** • **Less engaging** practice at home	**Accurate** • **Inaccurate communication** between **doctor and yoga tutor**
Opportunities	• Provide **reliable integrated plan** curated for **individuals**	• **Responsive and professional support** with **instructions** for home yoga practice	• Integrated platform to build **lineage connection between doctor & yoga tutor**	

Persona 2

"Compression garment is not comfortable to wear which is not helpful for doing yoga consistently."

Huiwu Stage

	one month	Two	4 months	7 months & above
Behavior	• Strong pain • Can' t manage daily stuff • **Lie on bed**	• Sign up for yoga classes • **The pain disturb when practicing** • Tries compression garment		• **Uncomfortable wearing** from compression garment • **Fatigue** occurs • **Can' t consistently** practice yoga
Pain points	**Assured** • **Unstable mental state**: worrying recovery process	**Comfortable** • **Negative user experience** from compression garment causes mental stress		**Sustainable** • **Consistency matters** for yoga rehabilitation • **Fatigue** can be easily caused due to the **pain and stress**
Opportunities	• Platform support the **education for aftercare**	• Provide **alternative support with improved user experience** for yoga practitioner • From improving UX to **encourage consistent & engaging yoga practice**		

User Flow

	Continued medical support	**Pain alleviation**	**Companionship**	**Continued following up**
Stage	Giving Instructions	Executing instructions		Re-practicing Instructions
Goal	**Doctor** Clear instructions **Users** Clear understanding	**Doctor** Instructions are given clearly **Yoga Tutor** Sharing seminar, Q&A **Users** Executing functions		**Doctor** Follow-up **Yoga Tutor** Sharing & Q&A **Users** Practices sustainably

Steps

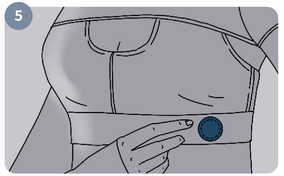
Storyboarding

Rehabilitation starts **confirmed by doctor**

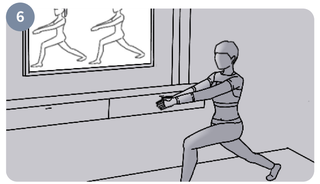
Doctor fills in the info on app for **recommendation for yoga & vibration amplitude**

Vibra yoga wear **received by user**

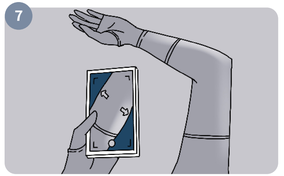
User **signs up on app** and **review**



User **practices** with Vibra yoga wear



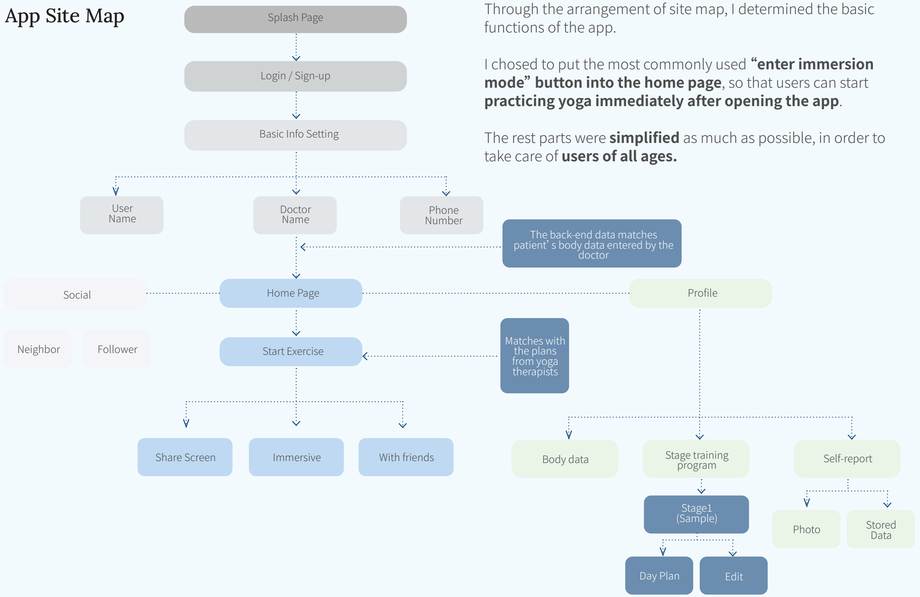
User practices **with others** in **immersive**



User uses **tape measurement** for **updating rehabilitation progress**

Doctor gets the info over app
Updates recommendations

App Site Map

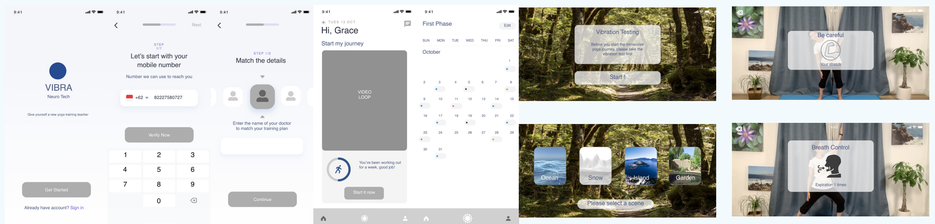


Through the arrangement of site map, I determined the basic functions of the app.

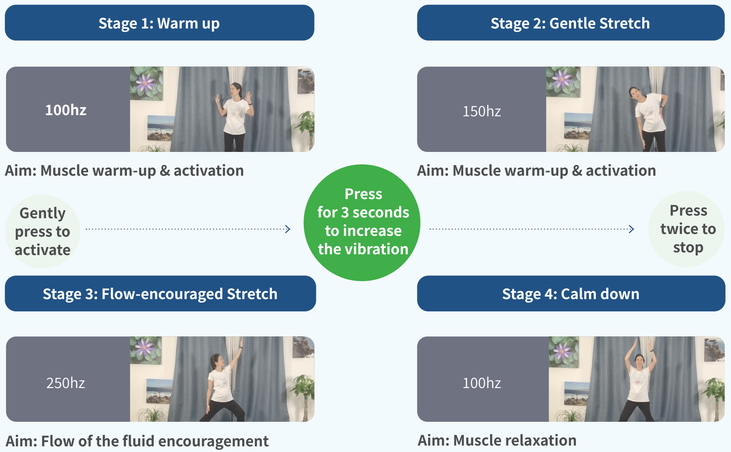
I chosed to put the most commonly used **“enter immersion mode” button into the home page**, so that users can start **practicing yoga immediately after opening the app**.

The rest parts were **simplified** as much as possible, in order to take care of **users of all ages.**

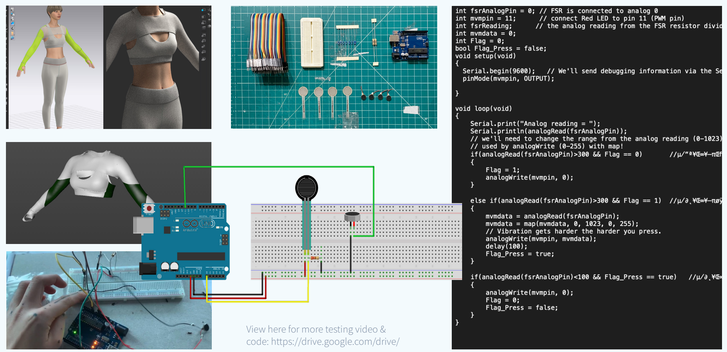
Low-fi App Development



Yoga-wear Vibration Mechanism Diagram



Product Development



View here for more testing video & code: https://drive.google.com/drive/

CONCEPTUALIZATION: Visual Identity

Type System

H1 Source Sans Variable

H2 Lucid Grand Regular

H3 PROXIMA NOVA

P Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh

Color System

Primary

Grey

UI Elements

Logo

VIBRA NeuroTech

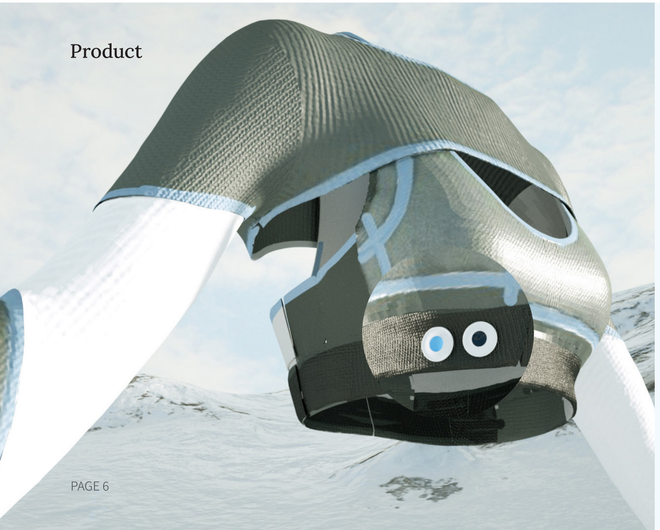
Source Sans Variable Regular

Lucide Grand Regular

Final

VIBRA NeuroTech

Product



Two vibration modules on the side:

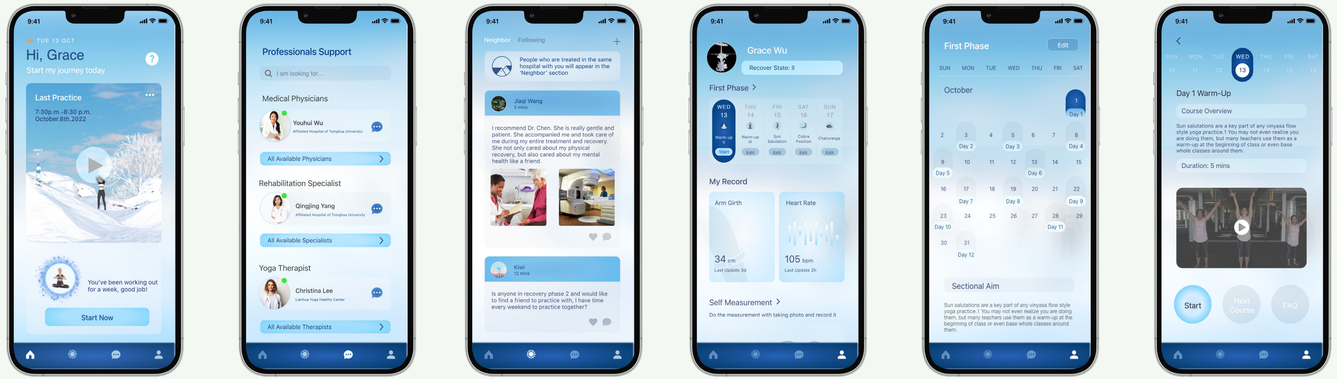
Module A: Basic vibration level maintenance
1 Quick tap: Vibration activated
2 Quick tap: Stop vibration

Module B: Vibration amplitude increase
1 Long tap: Increase vibration
2 Quick tap: Stop vibration

Preliminary user testing
We made a yoga-wear with same design with vibration module to test the **wearing comfortability, vibration level experience during yoga practices and user' s success rate of in activating vibration.**

CONCEPTUALIZATION: Hifi-mock-up

Hifi-generative Model (App)



Hifi-generative Model (App: Immersive)