



# VIBRA NeuroTech

A close-up photograph of a person's hand gripping a light-colored wooden mallet. A thick blue strap is wrapped around the handle. The background is blurred, showing more of the mallet and some other equipment.

eline

nths

m

arch: Christina Yang & Yanghu  
el Generative: Christina Yang & Yanghu  
sign: Yanghu  
el Testing: Christina Yang

My favourite Chinese female signer: Beina Yao, was dead due to cancer a decade ago. Since then, I have been laid my eyes on this which represent 15.3% of all female cancer cases.

It 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 aftercare for Breast Cancer survivors.

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

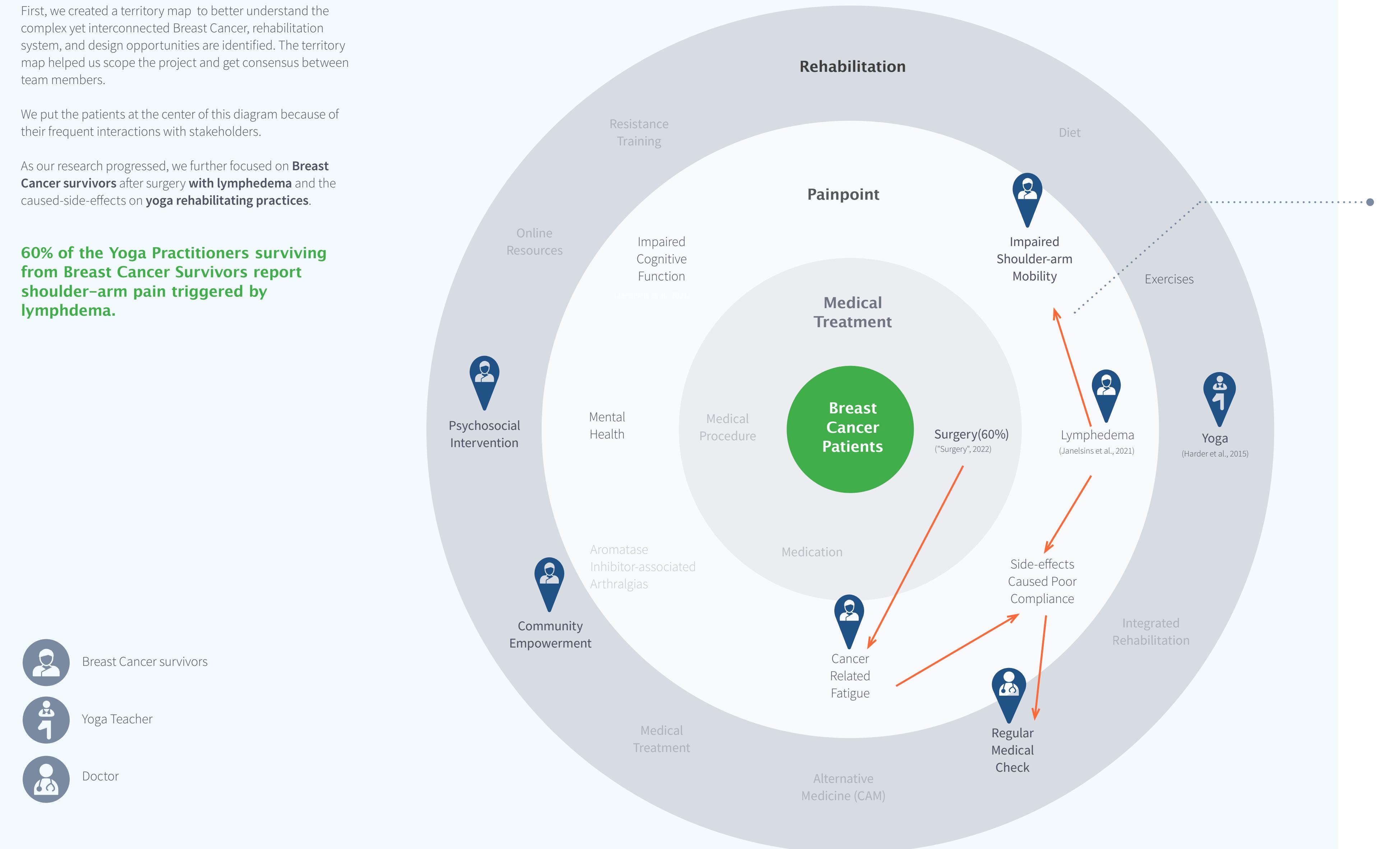
## RESEARCH: Scoping Framework

First, we created a territory map to better understand the complex yet interconnected Breast Cancer, rehabilitation system, and design opportunities are 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.

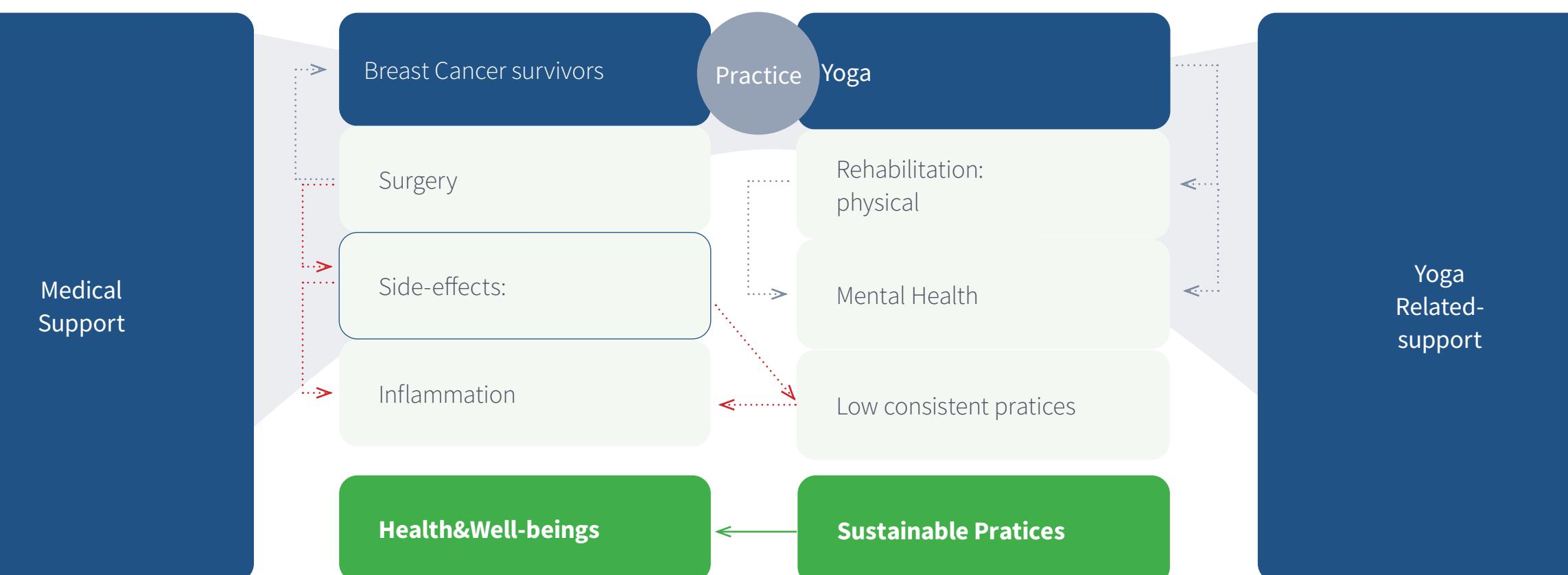
As our research progressed, we further focused on **Breast Cancer survivors** after surgery with lymphedema and the caused-side-effects on **yoga rehabilitating practices**.

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



## EXPLORATION: Analysis & Surveys

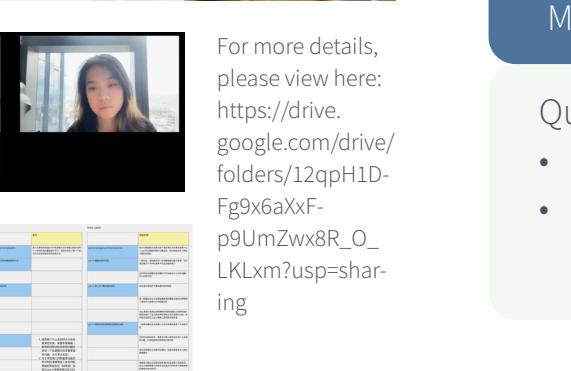
### Analysis



### 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 help us to build up sympathy mapping with more insights.



Type of Yoga	Privacy	Community	Fatigue	Mental State	Guidance
<b>Group Class Yoga</b>	✗ unguaranteed, not confident to be involved	✓ responsive Q&A, sharing..	✗ when difficult to be involved & follow	✗ when difficult to be involved & follow	✗ inresponsive guidance
<b>Private Class Yoga</b>	✓ yes	✗ no companion while teacher is supportive	✗ when concern about the cost	✗ expensive cost	✓ curated based on personal circumstance
<b>Online Yoga Classes</b>	✓ yes	✓ responsive Q&A, sharing..	✗ surgery related fatigue & no companion	✗ might do it wrong without responsive guide	✗ inresponsive guidance

## EXPLORATION: Current Solution & Case Study

### 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 trend in:

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

#### 2. Yoga-related platform/products



**Lymphedema-caused & 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	<ul style="list-style-type: none"> <li>Uncomfortable wearing during sports</li> <li>Easily sweat - not good for rehabilitation from cancer</li> </ul>
Whole Body Vibration	<ul style="list-style-type: none"> <li>Reduce musculoskeletal symptoms</li> <li>Cooperate with exercises plan&amp;proven to reduce pain&amp; stress</li> </ul>	<ul style="list-style-type: none"> <li>Prohibitive cost</li> <li>Non-portability of the system</li> <li>Inability to directly target a specific muscle group</li> </ul>
Local Body Vibration	<ul style="list-style-type: none"> <li>Portable vibrators directly over the tendon or muscle belly</li> <li>Neuromuscular adaptations for long-term durability &amp; strength-gain</li> </ul>	More tests are needed
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
Pivot
Digital Jalebi
iBreve
PocketYoga App
Movement For Modern Life
Liforme

**Four insights were identified during this stage:**

- Smart wearable devices**  
majority products are designed as wearable to be more convenient
- Pose-tracking**  
agents as Apps, yoga mats or screenings
- Yoga classes planning**  
apps enable personalized planning based on individuals
- No curated platform for Breast Cancer survivor special needs**
- Vibration Stimuli potential**  
promote neural and/or muscular (re)conditioning

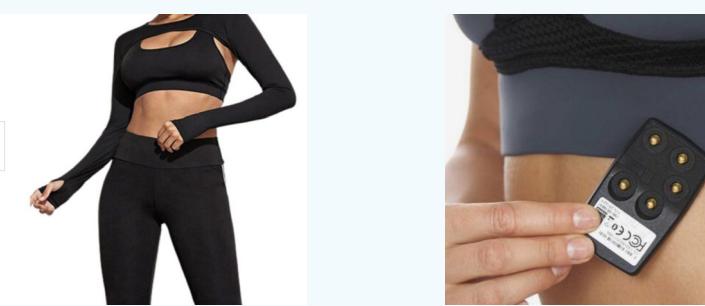
## EARLY GENERATIVE: Diagram Synthesis

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

### ● A Integrated Responsive Program

- + 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



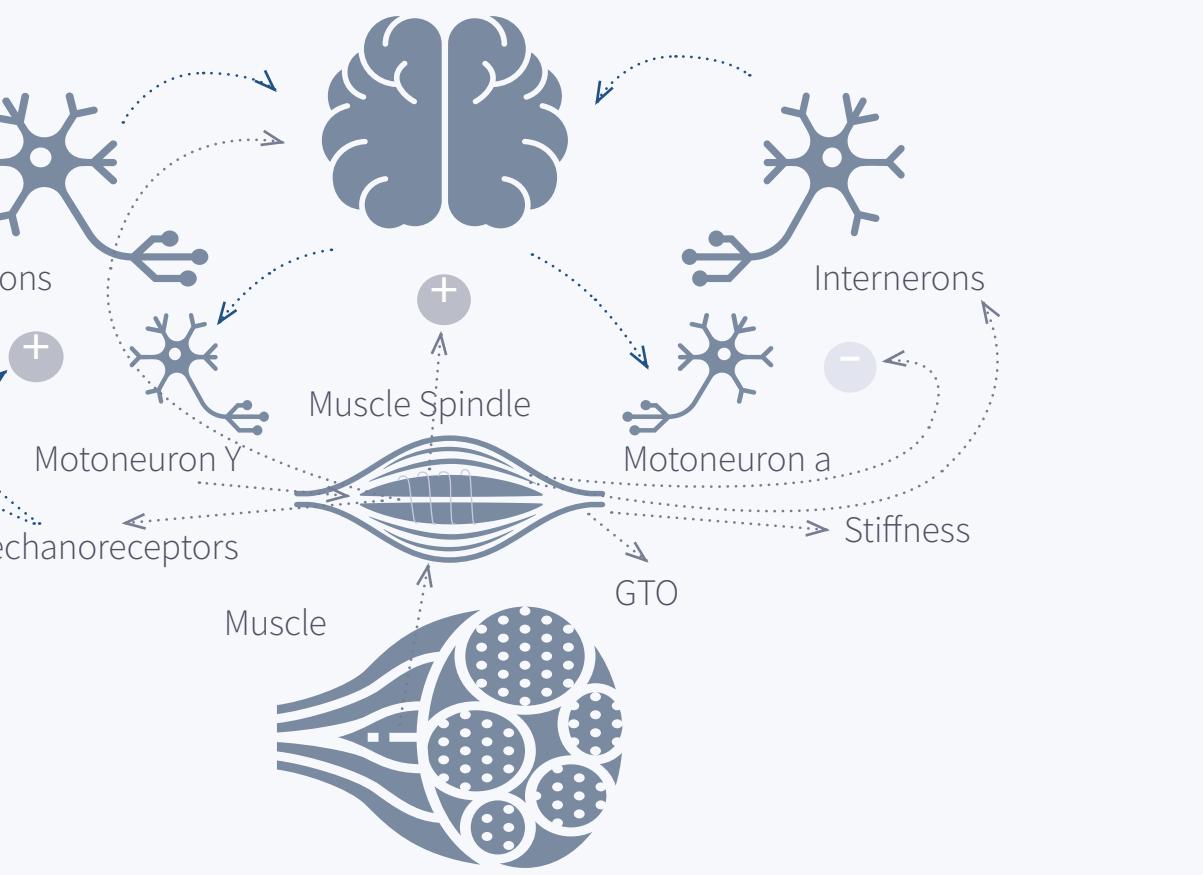
## Research Case Study: Local Vibration Therapy

### 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 with it.

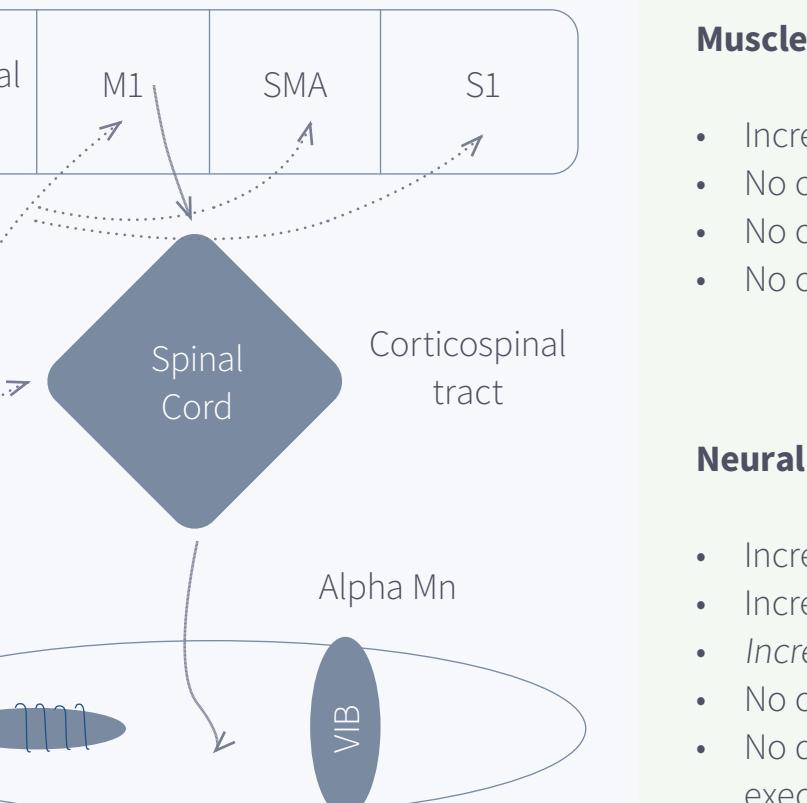
#### Paper 01:

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 (see image 1).



(de Sire et al., 2021)

#### Paper 02:



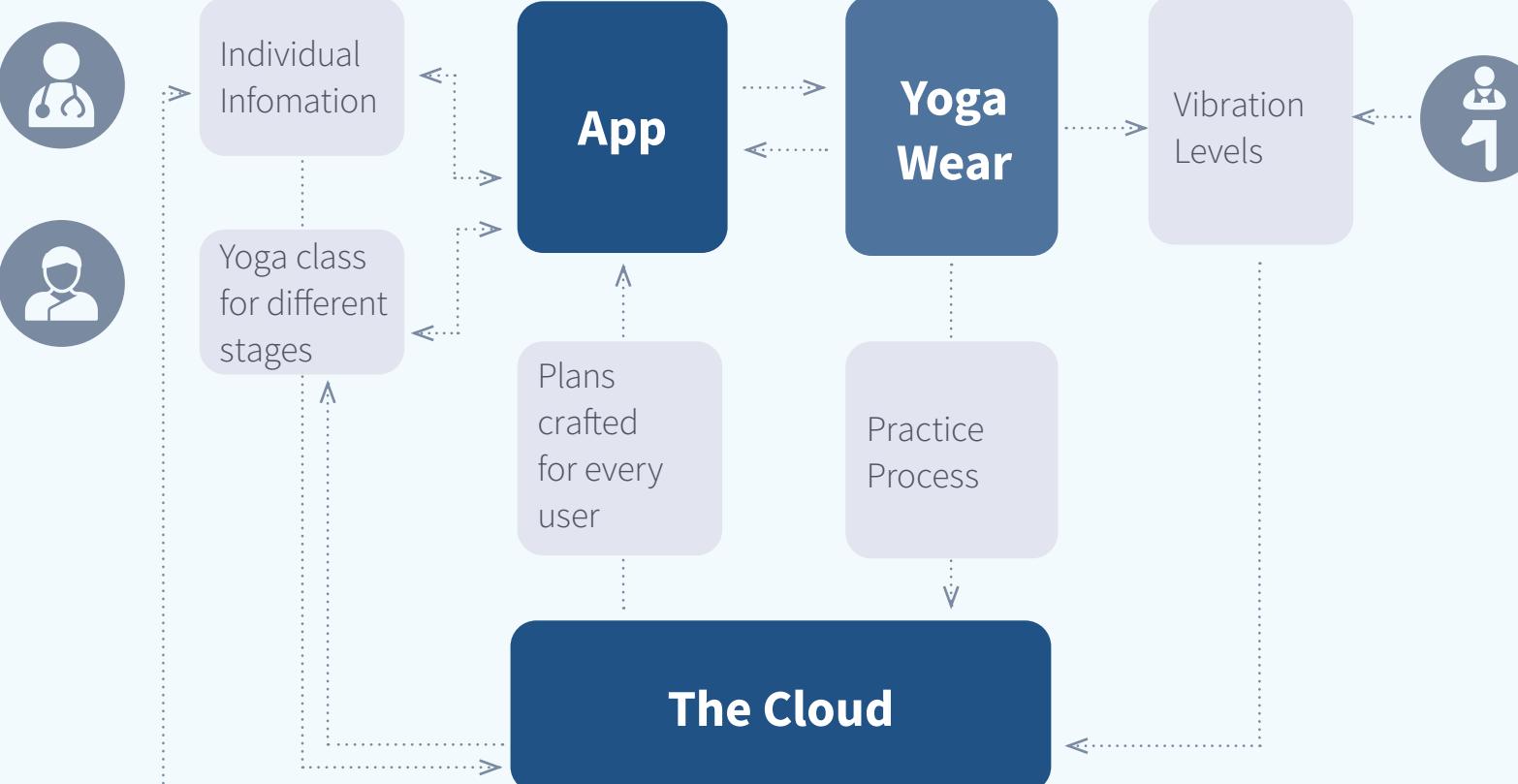
#### Muscle Performance

- 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

## Systematic Diagram



## CONCEPTUALIZATION: Concept

### Concept

#### Vibra Neurotech

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

#### Goal EUU Model

Through **alleviating shoulder-arm pain** during yoga rehabilitation caused by lymphedema from lymphedectomy, 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-beings of breast cancer survivors** with yoga activity.

#### Emotion

Reduce worries caused by uncertainty & lack of support

#### Usability

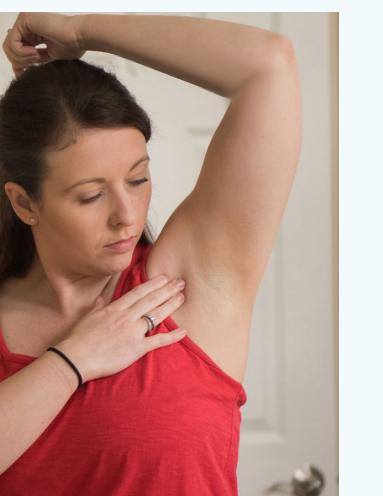
- Improved accessibility of professional planned yoga practices
- Sustain yoga practices by providing plans, community support & pain-controlled support

#### Usefulness

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

#### Target Audience

Breast Cancer Survivors  
After lymphedectomy  
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

## CONCEPTUALIZATION: Persona Development & User Flow

### Persona 1



Zihui Yang  
Age: 45  
5 months after lymphadenectomy

"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**."



one month

two months

4 months

6 months & above

Zihui Stage

#### Behavior

- |  |                    |                      |                      |                      |
|--|--------------------|----------------------|----------------------|----------------------|
|  | <b>Reliable</b>    | <b>Supportive</b>    | <b>Accessible</b>    | <b>Accurate</b>      |
|  | <b>Pain points</b> | <b>Opportunities</b> | <b>Opportunities</b> | <b>Opportunities</b> |
- Strong pain
  - Can't manage daily stuff
  - Lie on bed
  - Unstable mental state worrying recovery process
  - Provide reliable integrated plan curated for individuals
  - Start to operate daily stuff
  - Look for rehabilitation
  - Planning
  - Rehabilitation in hospital is time-consuming in transportation
  - Responsive and professional support with instructions for home yoga practice
  - Sign up for yoga classes in a ypga centre nearby
  - Private classes cost high
  - Less engaging practice at home
  - Inaccurate communication bewteen doctor and yoga tutor
  - Integrated platform to build lineage connection bewteen doctor & yog tutor

### Persona 2



Huiwu Zhang  
Age: 56  
8 months after lymphadenectomy

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



one month

two months

4 months

Huiwu Stage

#### Behavior

- |  |                    |                      |                      |
|--|--------------------|----------------------|----------------------|
|  | <b>Pain points</b> | <b>Opportunities</b> | <b>Opportunities</b> |
|  | <b>Assured</b>     | <b>Comfortable</b>   | <b>Sustainable</b>   |
- Strong pain
  - Can't manage daily stuff
  - Lie on bed
  - Unstable mental state: worrying recovery process
  - Platform support the education for aftercare
  - Sign up for yoga classes
  - The pain disturb when practicing
  - Tries compression garment
  - Nagative user experience from compression garment causes mental stress
  - Provide alternative support with improved user experience for yoga practitioner
  - From improving ux to encourage consistent & engaging yoga practice

### User Flow

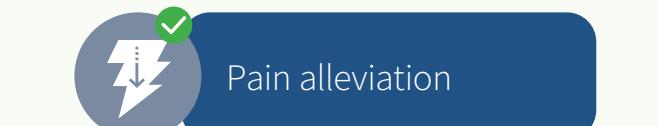
#### Stage



Continued medical support



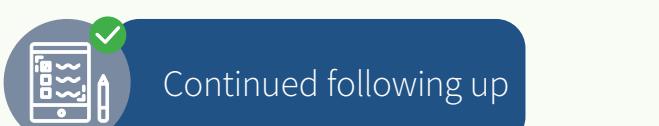
Giving Instructions



Pain alleviation



Companionship



Continued following up

#### Goal

**Doctor** Clear instructions  
**Users** Clear understanding

**Doctor**  
**Users**

Instructions are given clearly  
Executing functions

**YogaTutor** Sharing seminar, Q&A

**Doctor**  
**Users**

Follow-up  
Practices sustainably

#### Steps

Instructions &advices are given

Users are confused &unsure

APP crafts plan & prompt users to clarify

Expectations are clarified

Introduce himself in APP with yoga tutors & community

Practices repeatedly

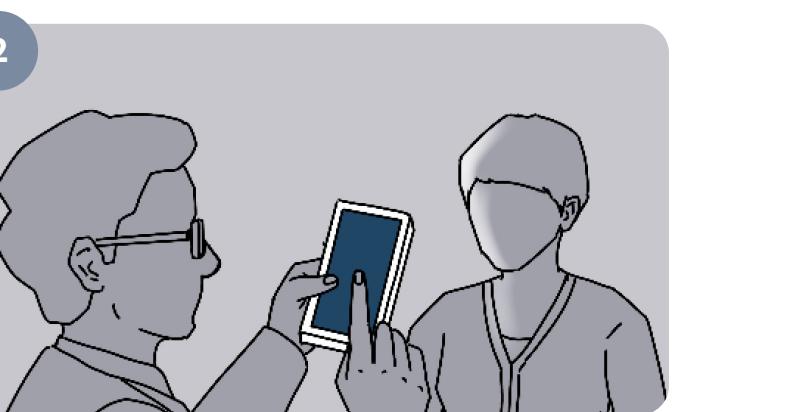
KNOWLEDGE INVOLVED  
COMMUNICATION INVOLVED

## CONCEPTUALIZATION: Storyboarding

### Storyboarding



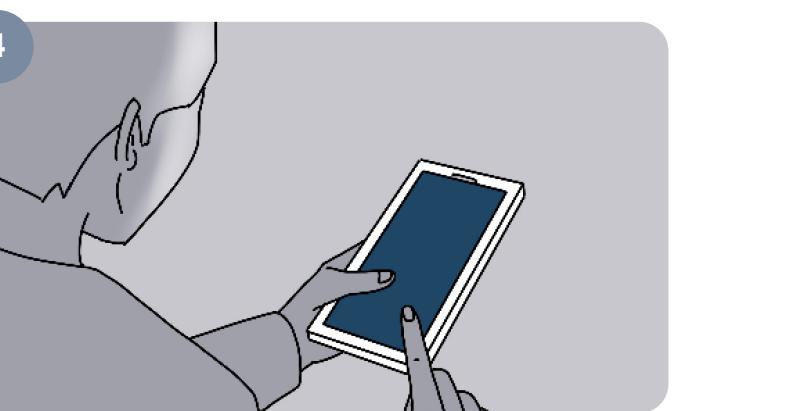
Rehabilitation started **confirmed by doctor**



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



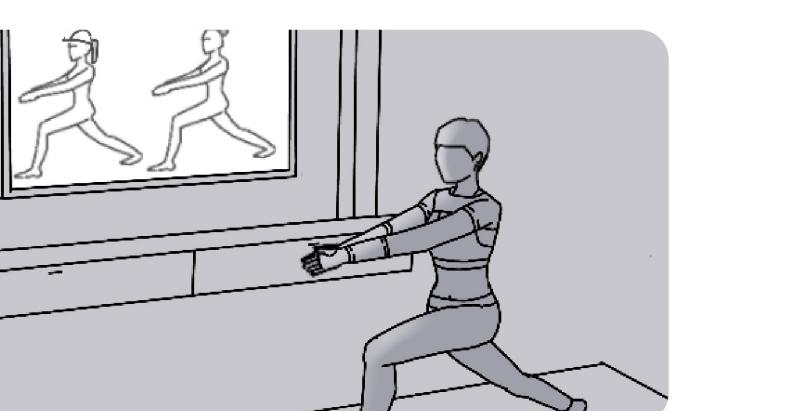
Vibra yoga wear received by user



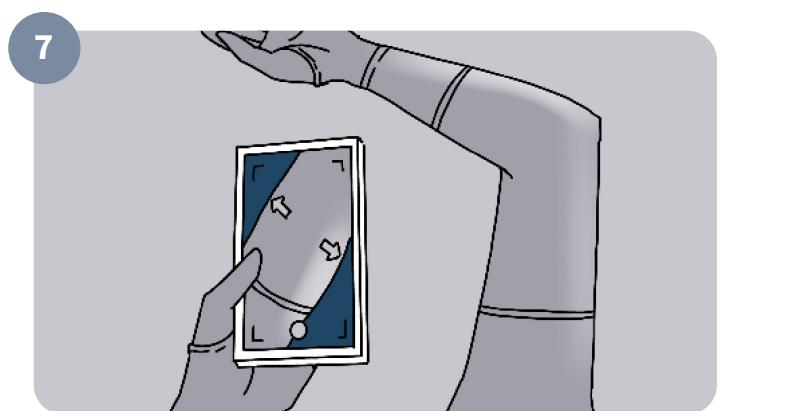
User sign up on app and review



User practice with Vibra yoga wear  
User practice yoga with vibration



User practice with others in **immersive mode**



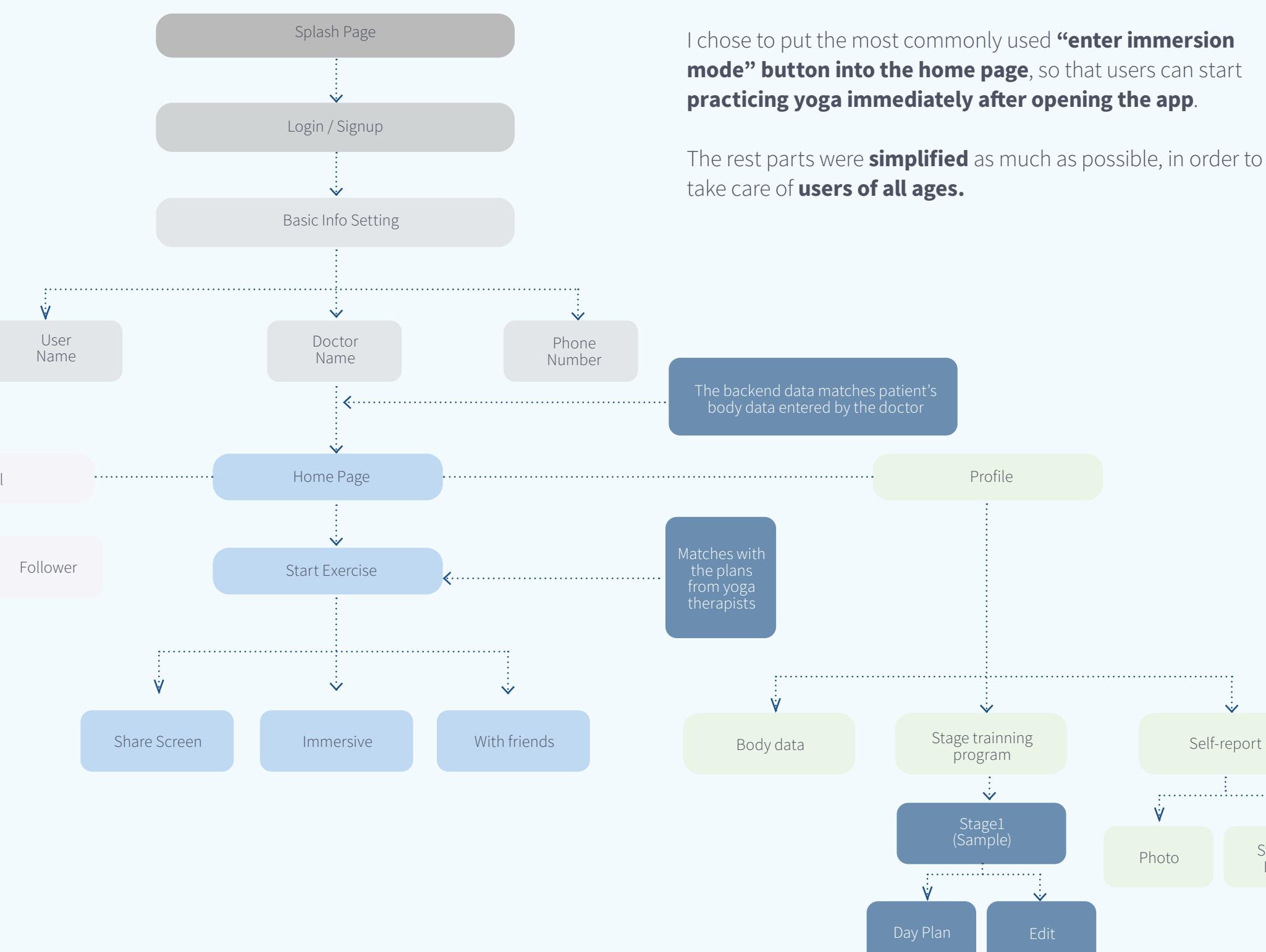
User use **tape measurement** for updating rehabilitation progress



Doctor gets the info over app  
Updates recommendations

## CONCEPTUALIZATION: Diagram Structure & Lofi-prototype

### App Site Map

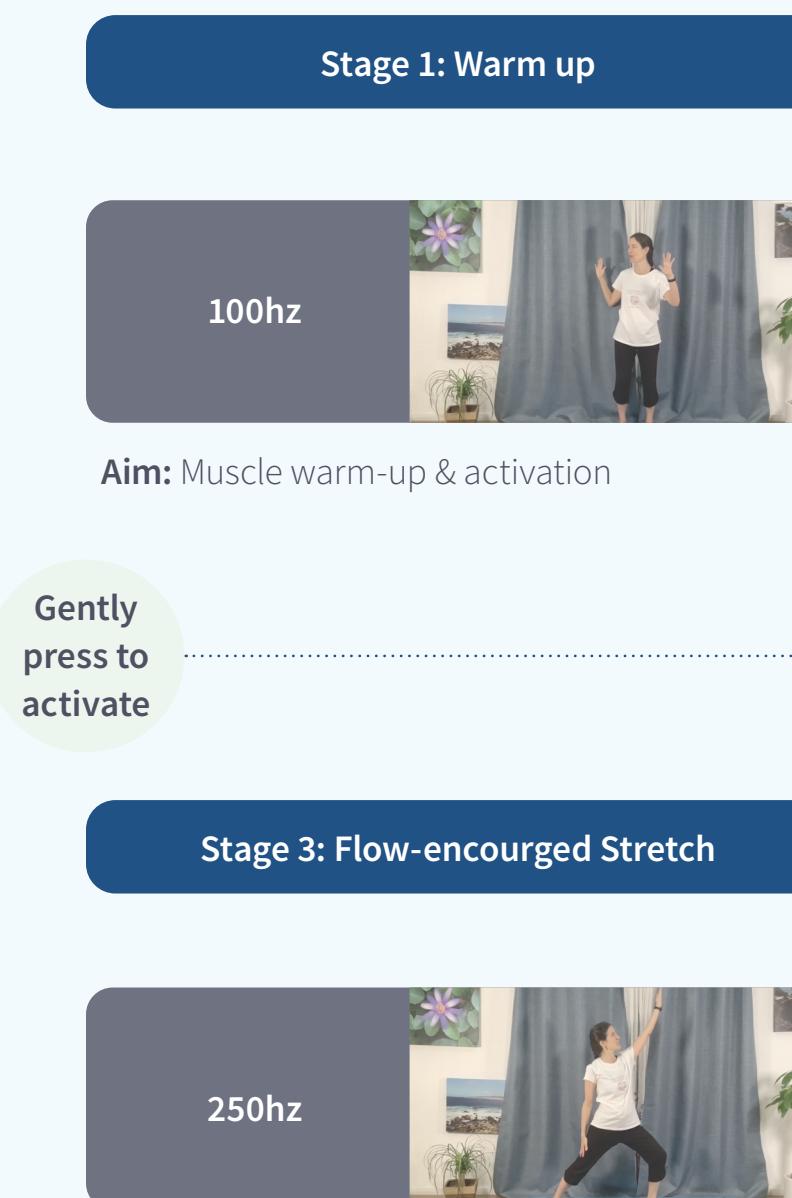


Through the arrangement of site map, I determined the basic functions of the app.

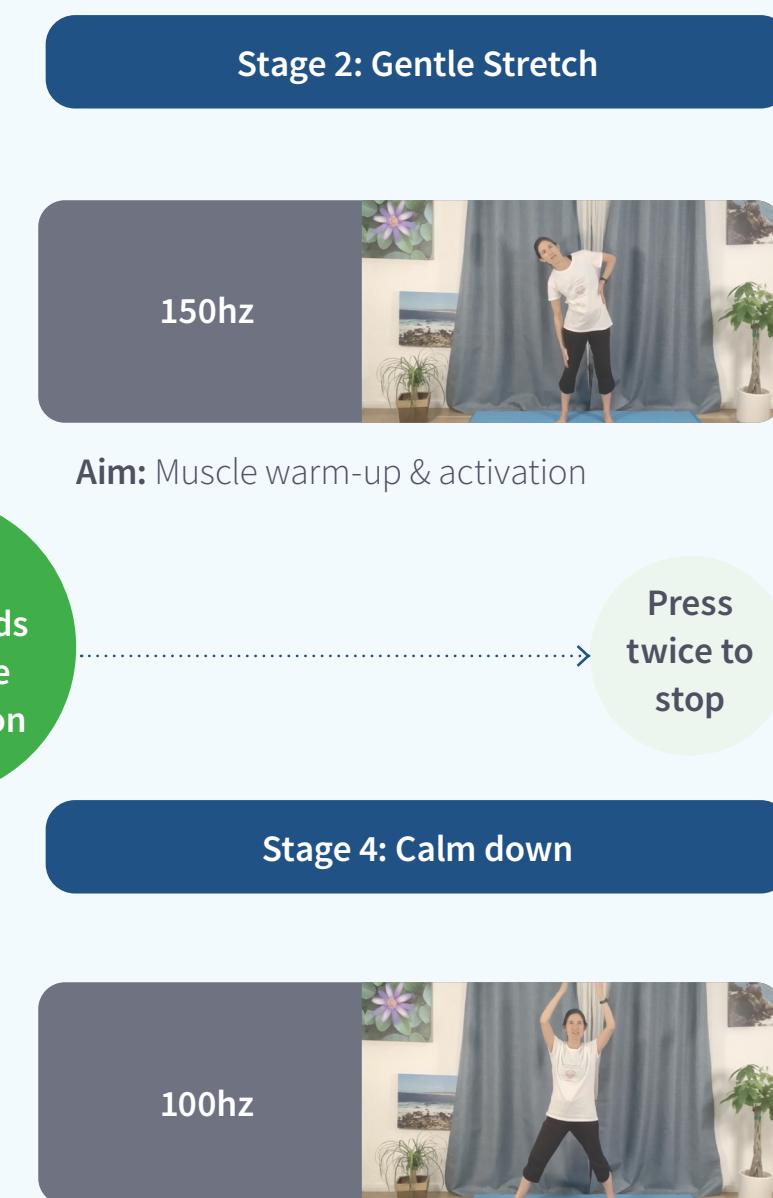
I chose to put the most commonly used “**enter immersion mode**” button into the home page, so that users can start **practicing yoga immediately after opening the app**.

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

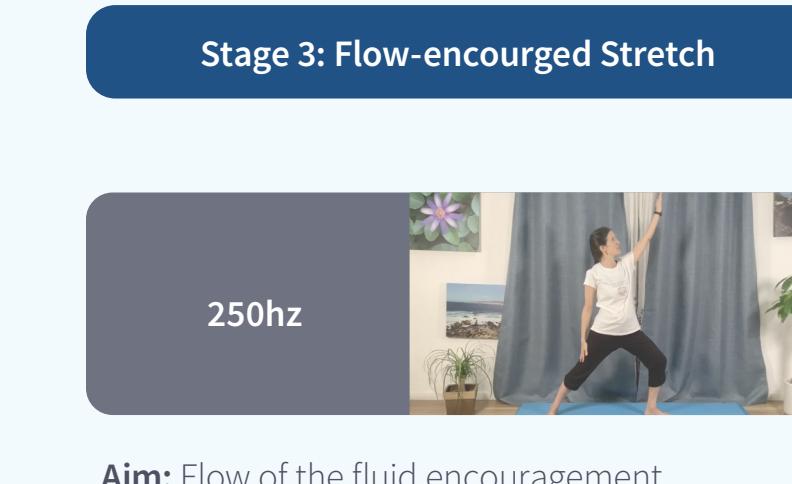
### Yogawear Vibration Mechanism Diagram



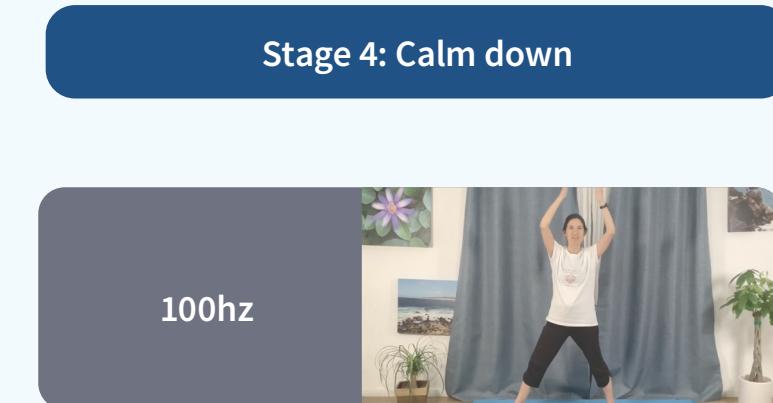
**Aim:** Muscle warm-up & activation



**Aim:** Muscle warm-up & activation

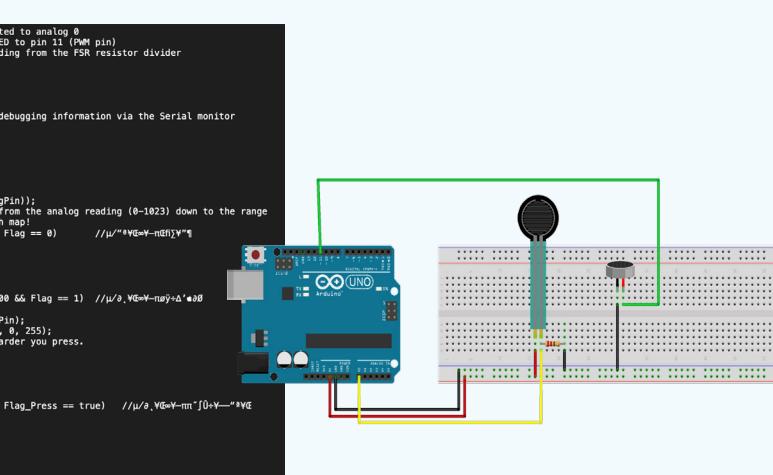
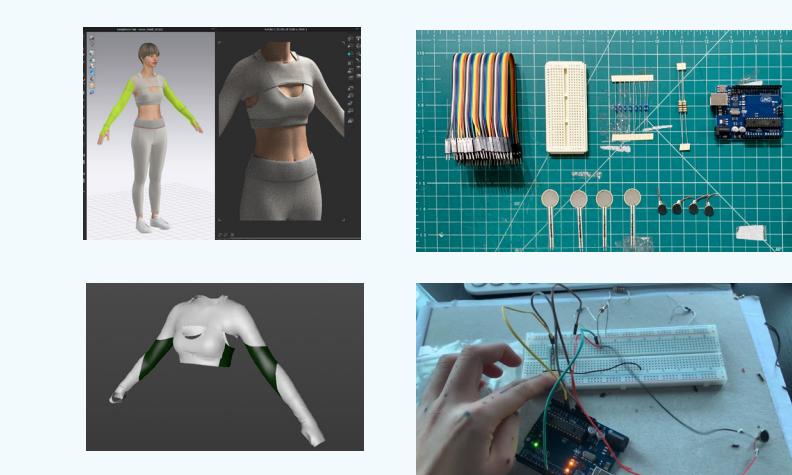


**Aim:** Flow of the fluid encouragement



**Aim:** Muscle relaxation

### Product Development



View here for more testing video & code: <https://drive.google.com/drive/folders/1pj9FQboxoNAf0MdH23uAr77kZUiVv4?usp=sharing>

## CONCEPTUALIZATION: Visual Identity

### Type System

H1 Source Sans Variable

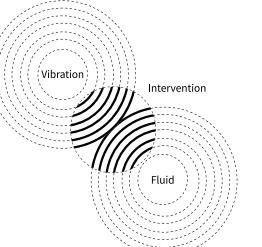
H2 Lucid Grand Regular

H3 PROXIMA NOVA

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

### Logo

**VIBRA**  
NeuroTech



### Colour System

#### Primary



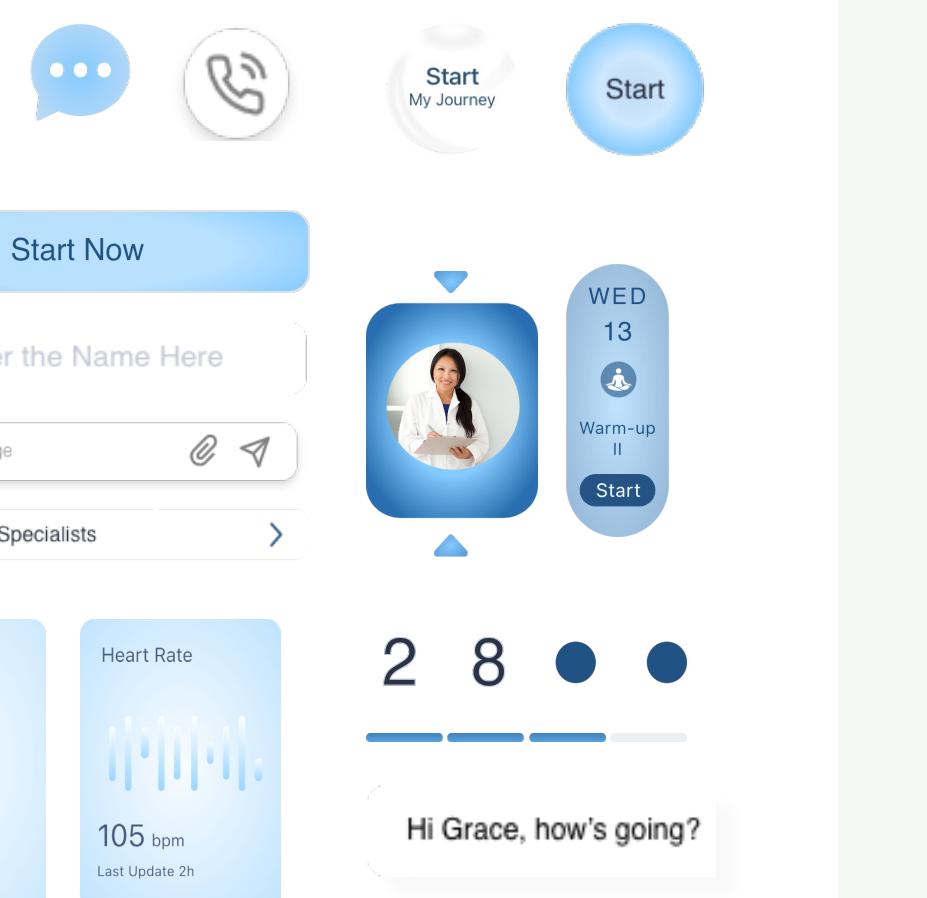
#### Grey



#### Final

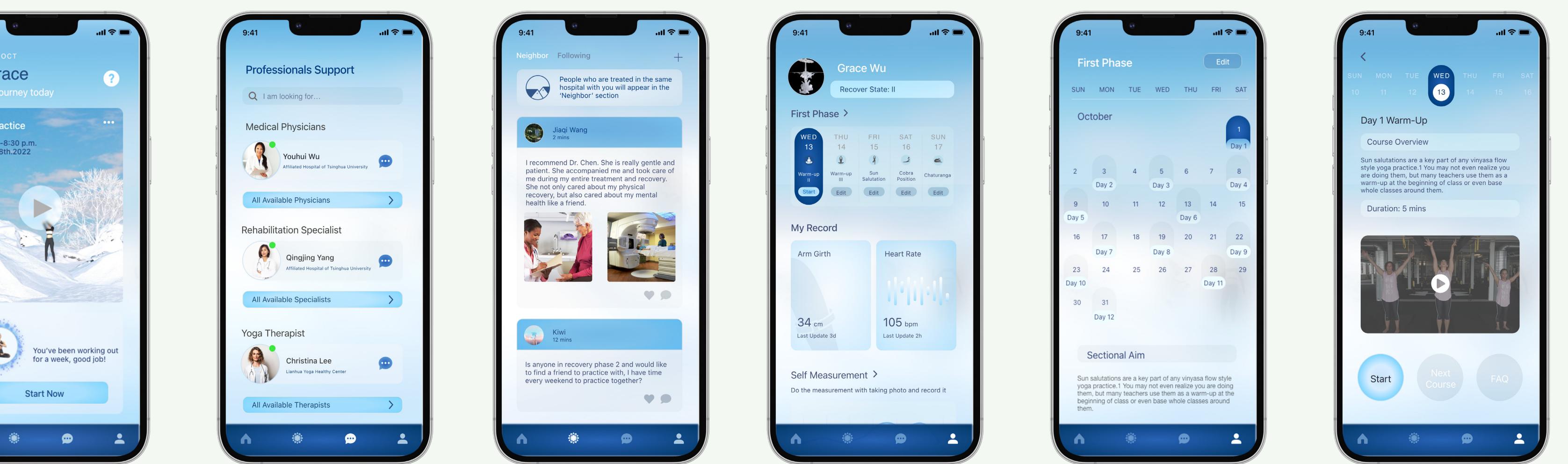


### UI Elements



## CONCEPTUALIZATION: Hifi-mockup

### Hifi-generative Model (App)



### 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 increasement

- 1 Long tap: Increase vibration
- 2 Quick tap: Stop vibration

#### Preliminary user testing

We made a yogawear 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**.



### Hifi-generative Model (App: Immersive)

