

# Sense.i

COURSE

INTERACTION DESIGN

SEMESTER

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FACULTY

A. FLEMING SEAY

TYPE

DESKTOP & MOBILE APPLICATION



TEAM

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BRIEF

PRODUCT THAT USES TECHNOLOGY AND DESIGN TO  
IMPROVE MENTAL HEALTH TREATMENT BY  
STREAMLINING THE PROCESS OF THERAPY.

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# Abstract

With an initial idea of helping people with mental disorders get better treatment, this project explores all the aspects related to mental disorders. Starting from basics of understanding mental disorders, focusing on Anxiety, the research delves into treatment and technology used in the healthcare industry. Apart from literature survey, input from psychologists is taken to strengthen the research, and develop a strong design direction based on the need of the industry.

Once direction is finalized, an intensive design process is followed to explore as many aspects and approaches possible to the problem. This ensures a an outcome that does justice to the initial problem, and caters to the requirements in a way that is accurate, aesthetic, and efficient.

The final product evolves as a therapy management application that streamlines the process of therapy, and making it easier for both therapist and user.

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01

## CONCEPT

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# Ideas and Goals

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*"Mental health is a level of psychological well-being or an absence of mental illness. It is the "psychological state of someone who is functioning at a satisfactory level of emotional and behavioral adjustment". From the perspective of positive psychology or holism, mental health may include an individual's ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience."*

( Wikipedia, 2018 )

In this fast paced society, the number of people suffering to mental health related problems is increasing. This rise in number of mental health conditions is true across all age groups. ( The Guardian, 2018 ). A study

The reasons for such a trend are many, but another issue that research highlights is that a large portion of people in need did not require the appropriate treatment or mental support. ( Scher, A. 2018 ).

## Direction

We targeted at using technology to detect mental illnesses before hand, and design a response system for that, to provide better medical care to the people in need.



**Title : Mental Health Disorder**  
Source : <https://www.everydayhealth.com>

02

## RESEARCH

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# Literature Review

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We started our research by trying to understand mental illness in depth. American Psychiatric Association defines it as below :

*"Mental illnesses are health conditions involving changes in emotion, thinking or behavior (or a combination of these). Mental illnesses are associated with distress and/or problems functioning in social, work or family activities".*

( Psychiatry, 2018 )

Although vast majority of individuals with mental illness continue to function in their daily lives, serious mental illness can result in serious functional impairment, which substantially interferes with or limits one or more major life activities.

Mental health conditions can also begin to develop in young children. Because they're still learning how to identify and talk about thoughts and emotions, their most obvious symptoms are behavioral.

Major types of mental illnesses can be categorized into :

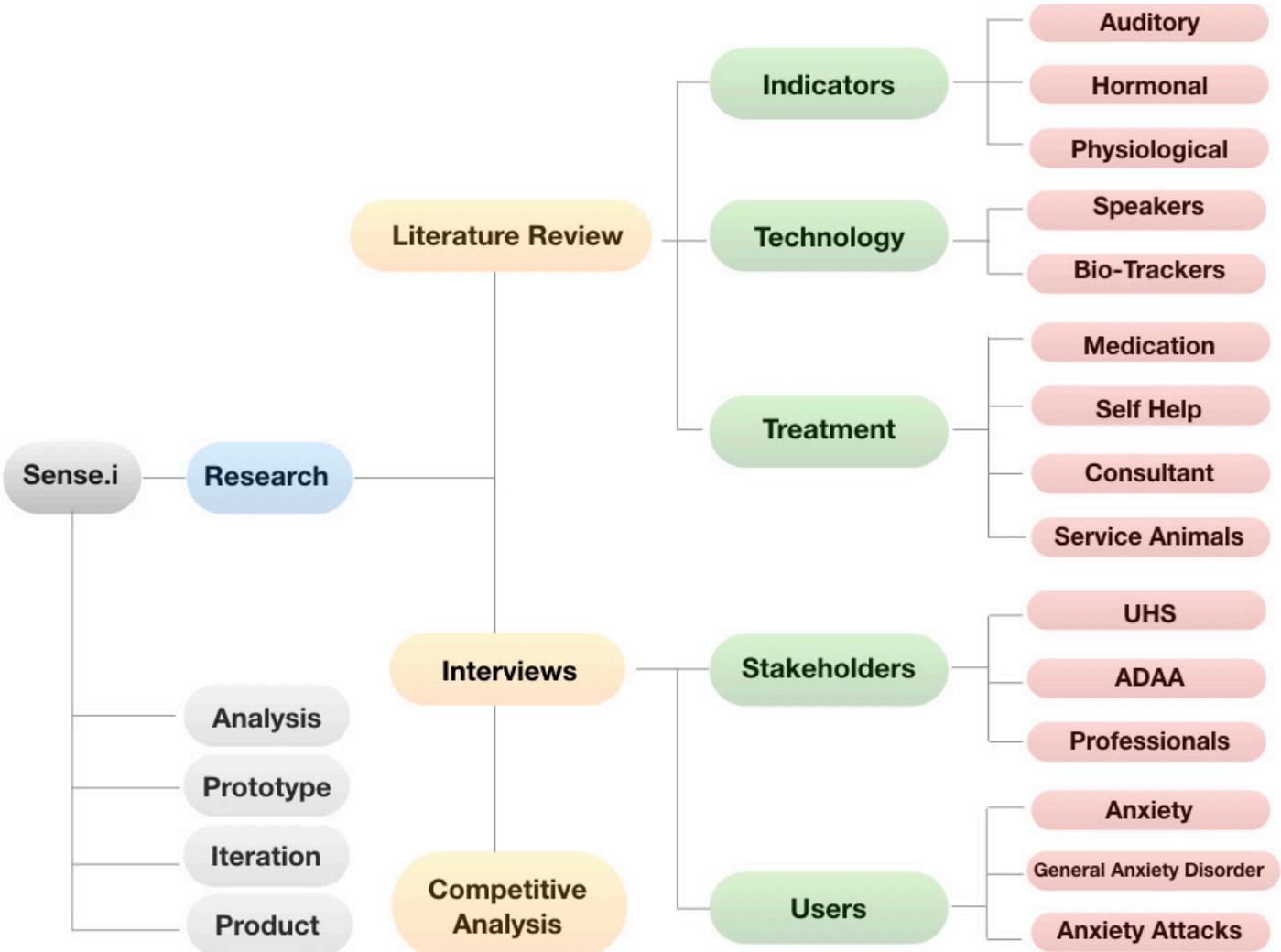
- Anxiety disorders
- Mood Disorders
- Psychotic Disorders
- Eating Disorders
- Impulse Control and addiction disorders
- Personality Disorders
- Obsessive Compulsive Disorder
- Post-Traumatic Stress Disorder

( WebMD, 2018 )

Anxiety disorders are the most common mental health concern in the United States. An estimated 40 million adults in the U.S. (18%) have an anxiety disorder. Meanwhile, approximately 8% of children and teenagers experience an anxiety disorder. Most people develop symptoms before age 21.

( NAMI, 2018 )

To focus our approach, and arrive at a target problem in the area of mental health, we decided to focus on **Anxiety** during our research.



*Title : Research Plan*

*Source : Author*

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## Anxiety & Indicators

Anxiety is a normal reaction to stress and can be beneficial in some situations. It can alert us to dangers and help us prepare and pay attention.

Anxiety disorders differ from normal feelings of nervousness or anxiousness and involve excessive fear or anxiety. Anxiety disorders are the most common of mental disorders and affect more than 25 million Americans. But anxiety disorders are treatable and a number of effective treatments are available. Treatment helps most people lead normal productive lives

The most common type of anxiety disorders are

- **General Anxiety Disorder** - chronic, exaggerated worrying about everyday life
- **Social Anxiety Disorder** - intense fear about social interaction, often driven by irrational worries about humiliation
- **Panic Disorder** - panic attacks and sudden feelings of terror sometimes striking repeatedly and without warning.
- **Phobias** - strong and irrational fear as a reaction to certain places, events, or objects.

The common effects of anxiety are :

### Physiological

- Sweating
- Heavy breathing
- Change in pallor
- Watery eyes
- Headaches
- Stomach aches; nausea
- Fatigue; reported change in sleep pattern
- Change in appetite
- Gastrointestinal problems

### Behavioural

- Irritability
- Shouting at others
- Inappropriate language towards staff and classmates
- Muttering under breath
- Physical aggression
- Increase in repetitive behaviours
- Increase in rigid routines and rituals
- Increase in obsessional thoughts
- Hiding/escape
- Refusal to complete assigned work
- Decreased attendance at school/school refusal
- Self-injury

Various studies also point out measurable factors that body goes through before episodes of mental disorder, specifically panic attack anxiety. (Nauert, R. 2011). Studies like EmotionSense also point towards definitive methods of detecting user emotion using voice analysis through standard mobile devices. Based on these studies, a speculative list of factors that can be potentially used for detecting anxiety beforehand is :

- Change in skin, salivary, and urinary pH
- Change in adrenaline levels
- Change in heartbeat
- Change in respiration pattern and stats
- Change in blood flow to different parts of body ( more related to fight-flight response)
- Voice
- Sweating ( Skin Conductance )

## Treatment

Different anxiety disorders have their own distinct sets of symptoms. This means that each type of anxiety disorder also has its own treatment plan. But there are common types of treatment that are used :

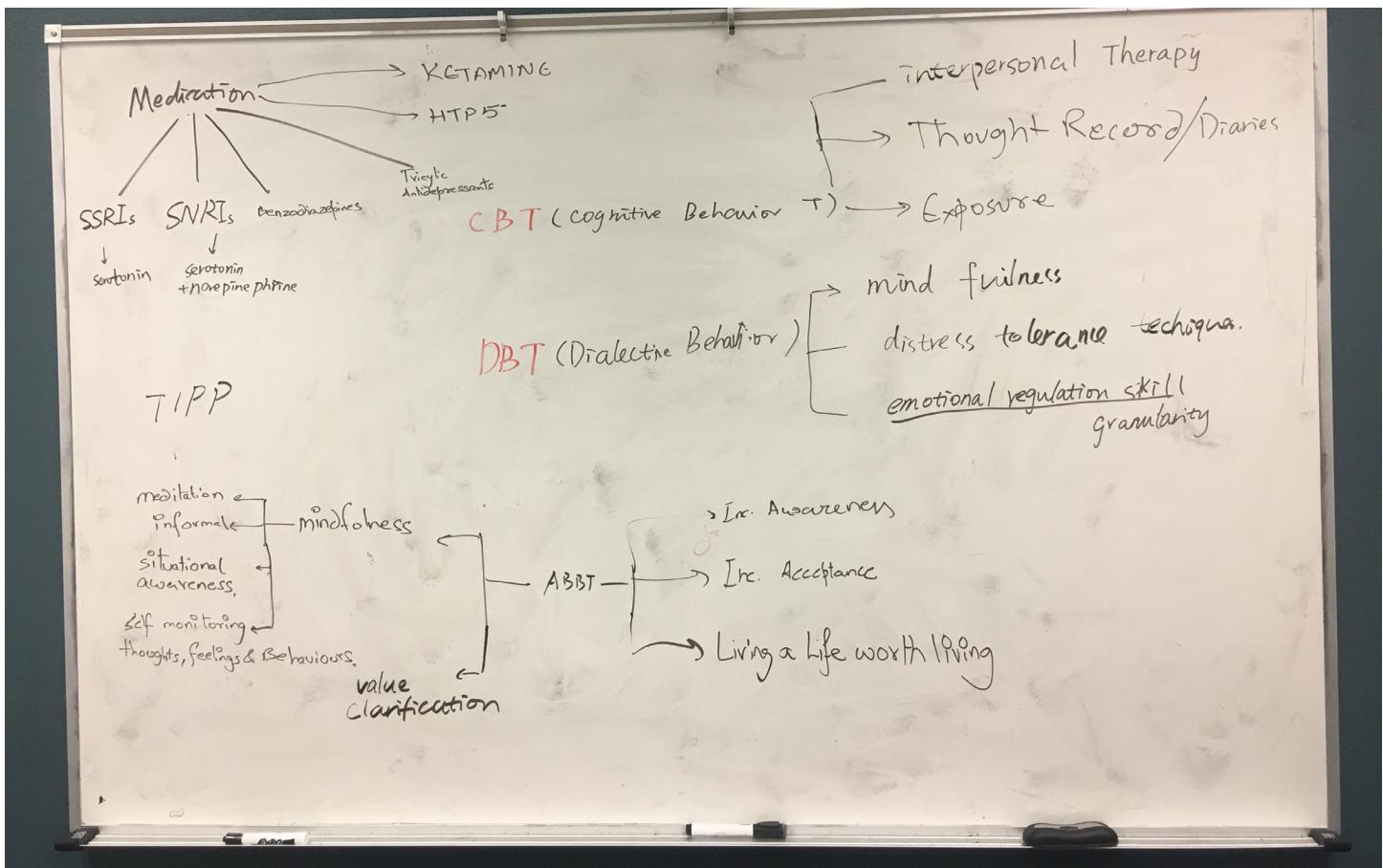
### Psychotherapy

Help the patient regulate their emotions, manage stress, understand patterns in behavior that affect their interpersonal relationships.

- **Cognitive Behavioral Therapy (CBT) :** focuses on our reactions to events, not changing the events themselves. CBT offers many constructive strategies to reduce the beliefs and behaviors that lead to anxiety symptoms. Finding the counterproductive thinking patterns that contribute to anxiety is a cornerstone of CBT. Various techniques used in this therapy are Exposure Therapy, Mindfulness and Thought Record. This method has the largest research base to support its effectiveness.
- **Dialectic Behavioral Therapy (DBT) :** DBT places an emphasis on mindfulness, enabling people to recognize and attempt to understand thoughts as they occur. It examines multiple or often contradictory ideas, combining acceptance and change simultaneously.
- **Acceptance-Based Behavior Therapy (ABBT) :** ABBT is a group of therapies that encourages people to approach their emotions and reactions as natural and normal and to realize that these feelings are not permanent ways of being, but that they will increase and decrease over time.

## Medication

The two general types of medications used to



## Title : CBT Treatment

Source : Author

treat anxiety disorders are:

- **Antidepressants** (despite the name, they're the first-line treatment)
- **Anti-anxiety medications** (sometimes called anxiolytics)

Four major types of medications used are :

- **Selective Serotonin Reuptake Inhibitors (SSRIs)**
- **Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs)**
- **Benzodiazepines**
- **Tricyclic Antidepressants**
- **Ketamine**

## Complimentary Approaches

More and more people have started using complementary and alternative treatments along with conventional treatment to help with their recovery. Some of the most common approaches for treating anxiety include:

- **Self-management strategies**, such as allowing for specific periods of time for worrying. Someone who becomes an expert on their condition and its triggers gains more control over their day.
- **Stress and Relaxation Techniques** often combine breathing exercises and focused attention to calm the mind and body. These techniques can be an important component in treating phobias or panic disorder.
- **Yoga**. The combination of physical postures,

### SPIRE



Measures and analysis users respiration patterns to detect stress, and provides realtime response to help manage it.

### THYNC



Delivers low-energy waveforms to stimulate nerves on head and face, allowing your body to relax or energize

### MUSE



Uses EEG sensors to measure brain activity in real-time, alerts user about stress through audio cues and management strategies

### WELLBE



monitors users heart rate and uses an algorithm to determine stress and calmness based on time, location and people user meets.

### FEEL



bio-sensors monitor a variety of physiological signals (skin conductance, skin temperature, heart rate), and provide CBT techniques when needed.

### PRANA



designed to rapidly activate users body's relaxation response through proper diaphragmatic breathing and good posture.

## Title : Stress management gadgets

Source : Author

breathing exercises and meditation found in yoga help improve the management of their anxiety disorder.

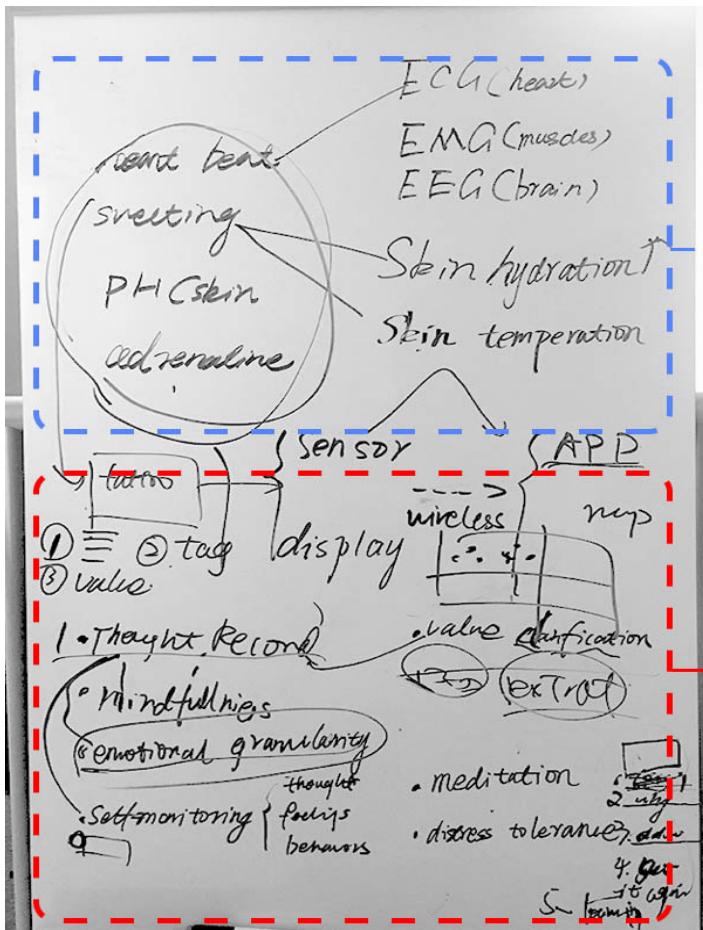
stats in the list mentioned above, or that claim to measure mental health.

- **Exercise.** Aerobic exercise can have a positive effect on stress and anxiety.

( Nami, 2017 )

## Technology

Second part of the research was studying about existing technologies being used in monitoring and treatment in the healthcare industry. The research was directed at products that measure



Bio-integrated device technology being matched with the appropriate measurement factor which can act as indicators of anxiety

Main ideas being selected based on how well they target the problem our product is targeted at.

**Title : Matching indicator with technology**

Source : Author

## Competitive Analysis

Next step in the research required understanding services and applications that were aimed at helping individuals with anxiety. Different applications depended on different strategies to achieve their goals. We started by briefly analysing top 50 apps that claimed to help with anxiety, and categorizing together apps that used similar strategies.

Common strategies that these apps relied on are :

- Emotional Log in
- Color therapy

- Goal Setting
- Progress record
- Thought Record
- Positive Thoughts
- Incentives/Rewards
- Calendar
- Healthy Habit Trainer
- Gratitude
- CBT questions
- Gamification of tasks
- Music/audio stories/sounds for sleep/relax
- Meditation guidance
- Breathing guidance



**Title : Competitive Analysis Chart**

Source : Author

- Videos for relax body
- Professional lessons
- Community support
- Advice
- Useful articles
- Message/Goup Chat

Quite a few of these apps had research backing their approach of helping with anxiety. Out of these apps, we selected 11 with maximum user base and positive reviews to analyze in a competitive analysis format, making sure we covered all the treatment categories listed above.

# Interviews

To research further, and get accurate information and opinion on our approach, we were able to interview 3 PhD students.

One was from Texas Material Institute at UT Austin, and Other two were PhD students at Department of Psychology at UT Austin, and were a part of Anxiety and Stress Clinic. The findings from the interview is presented ahead.



*Title : Interview with Santiago Papini*

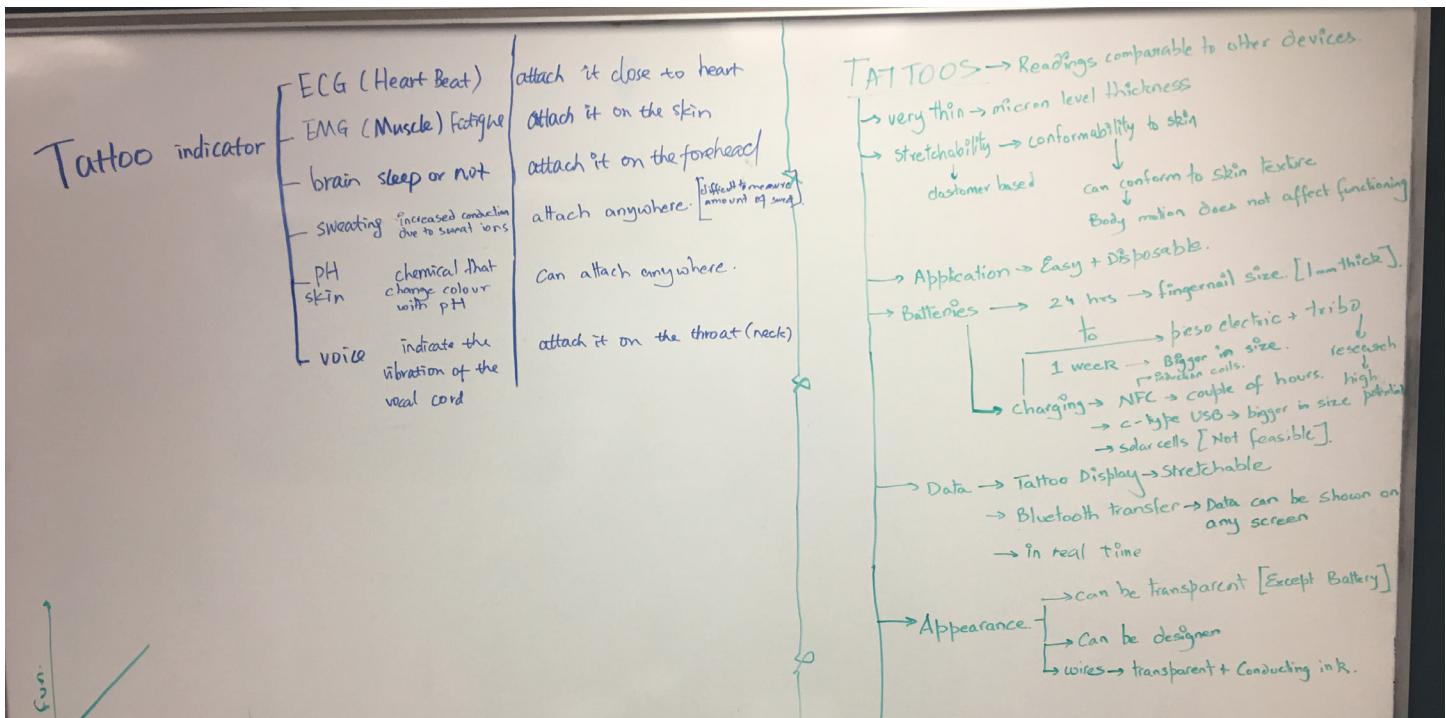


*Title : Interview with Jolene Jacquart*



*Title : Interview with Jolene Jacquart*

# Interview 1



## Title : Learnings from Interview 1

Source : Author

Name: Hongwoo Jan

Role : PhD student, Texas Materials Institute, UT Austin

Health data measuring capabilities of current bio-integrated tattoo technologies :

Measurable Factor	Place of Application
ECG - Heartbeat	Close to heart, or wrist, from where pulse can be measured
EMG - Muscle Fatigue	Anywhere on the skin
Brain Activity	Attach on or near forehead
Sweating - Electric Resistance	Anywhere on the skin
Skin pH	Anywhere on the skin
Voice Frequency	Attach on throat surface

Data provided by tattoos is as accurate and reliable as other machines used in the industry.

**Physical Properties** : micron level thickness with good skin conformity. They can conform to skin texture, and data is not affected by other any body motion.

**Application** : Easy and disposable. user does not need help in using them.

**Batteries** : Batteries are extremely small. 1mm thick fingernail sized battery, can last for 24hrs. Larger batteries can last for 1 week. Various charging technologies are peso and tribo elec tric ( research going on ), NFC ( couple of hours needed to charge ), C-type USB charging (bigger in size ), and Solar ( not feasible for health monitoring applications ).

**Data** : Can be displayed on tattoo itself, but available surface area is extremely limited. Feasible option is bluetooth transfer to other device like mobile phone.

**Appearance** : Can follow any design pattern, or can be transparent ( except the battery ).

## Interview 2

Santiago Papini

Fear	Anxiety
proximity imminent	distant
sensations strong/brief	mild/enduring
threat clear	uncertain

Pathological Anxiety: Anxiety disorder. Emotional response which is not serving adaptive function.

Anxiety: adaptive response to a situation

The right amount of anxiety is a good thing

Fight / Flight / Freeze

- blood to digestive system cut off
- light headed
- blood sourced to limbs
- fast heart beat
- sweating, can happen to anyone
- panic attack
- different
- Panic disorder: can't go on with their normal life

No known proven cause of why people develop GAD. Combination of factors.  
Depends on orientation of mind  
Biology → neuroimaging  
→ genetics

Detecting Anxiety Beforehand

Preparing for the situation can function as a maintaining factor.  
maintains the problem after it has been established.  
(counter intuitive)

A tool that is adaptable and customizable. Provider/Therapist is able to customize it.

Reason current apps don't work is because they don't focus on a 'specific' problem.  
These apps are good for sub-clinical anxiety.

Treatment differs from person to person -  
CBT → Most research backed treatment method

- cycle education: make them understand the process
- identify preception
- exposure therapy → go through the anxiety. Don't do anything about it or avoid it.

Tech (machine learning)

tattoo/detect:  
something abnormal been detect  
ask users:  
- feel anxious?  
- rate the degree  
learn from these to get more accurate detection on Anxiety.

compare one's thoughts with body response → make patient know the anxiety is really not a big deal

### Title : Learnings from Interview 2

Source : Author

Name: Santiago Papini

Role : PhD student, Department of Psychology-  
UT Austin - Anxiety and Health Behaviors lab

The interview was extremely useful in gaining an in-depth understanding on anxiety and its treatment using CBT.

Anxiety is a form of fear with some key differences. In fear, the threat is imminent and clear, and the feeling is strong but brief. On the other hand, in anxiety the threat is distant and uncertain, and the feelings are mild but enduring.

They both stem from an individual's Fight/Flight/Freeze response that humans have developed as a survival tactic.

Anxiety is an adaptive response to a situation, and the right amount of anxiety is a good thing. It becomes a disorder when the anxious emotional response is not serving an adaptive function, and hinders normal lifestyle of an individual.

There are no definitive known reasons for why

a person develops General Anxiety Disorder, but it is thought to be a combination of multiple factors, on which research is still going on.

Treatment differs from person to person, but CBT is the most research backed effective treatment process. Components of CBT include:

- **Education** - make patient understand body responses and treat feelings related to anxiety as a natural response.
- **Identifying perception and thoughts**
- **Exposure therapy** - Stimulate anxiety causing situation to help user get over the fear of it, step by step.

One important consideration we were basing our idea was on detecting anxiety attacks beforehand, and developing systems to respond and mitigate the effects. Discussion on this opened a new perspective. This approach can have both positive and negative effects.

#### Cons :

- Detecting anxiety attacks and asking the individual to prepare for it can act as a maintaining factor. (\* *maintaining factor = maintains the problem after it has been established* ).
- The user can become too dependent on such a technology, which can lead to further problems that can increase his/her anxiety. He might always be worried about whether the anxiety detection device ( watch/tattoo) is working or not.
- Letting the individual know beforehand can also lead to him/her being more anxious of the “anxiety attack”, and over-prepare for that, in effect re-enforcing the message that something bad is going to happen.

#### Pros :

- If the counselor gets alert that their patient is going to have a panic attack, they can use it to complement therapy.
- It can be used as a method to track progress.
- Can help users correlate anxiety, action, and sensations. To overcome anxiety, one needs to experience it.
- Therapist can remind patients to record feelings and thoughts, which are better than memory recollection later.

This interview led us to rethink our approach on how what response would be appropriate, and develop systems accordingly once anxiety attack is detected. A negative effect can be counter-productive to treatment.

## Interview 3

Jolene Jacquart

natural emotion

Anxiety → False fear  
User needs to engage with bodily sensations.

Panic Attack → Sudden burst of physical sensations.

Exposure (most effective)

process

- ① Relief on avoiding the situation
- ② Experiencing it
- ③ → ① Overtime progress.

Hard to achieve. description based on memory, no streamlined process.

most apps are made for this. Work on sub-clinical anxiety. Useful.

very few apps for this stage.

Time

Treatment

Backed by research.

- CBT
- Exposure Based

Third Wave treatment  
Acceptance and Commitment therapy  
DBT → prevent self harm & suicide.

Also effective.

Cognitive Restructuring

look at your emotions objectively

overestimate the likelihood of bad things happening.

Hurdles in Treatment

- getting people to regularly come to therapy
- might need to involve family + friends.
- no streamlined process to manage / guide / track it.
- getting people to do the HW you assign.

no streamlined process to manage / guide / track it.

① self monitoring

mindfulness, thoughts, emotions, fear, mood, description in own words.

①, ②, ③ Start with therapist progress. Can do on their own

② Fear Analysis

Why are you fearing a situation.  
How bad can it actually get  
How bad was it after its over.  
Was fear justified?

③ exposure Therapy

extension on therapy practices in sessions

A B C D

pet 1

category u

category g

B

C

D

### **Title : Learnings from Interview 3**

Source : Author

Name: Jolene Jacquart

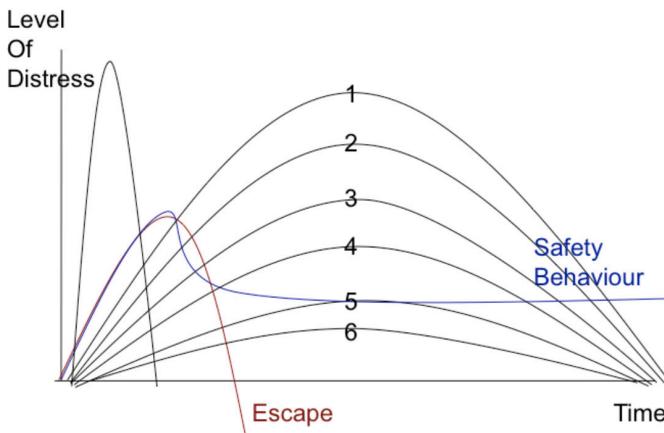
Role : PhD student, Department of Psychology-  
UT Austin - Anxiety and Health Behaviors lab

The second interview with Jolene was also very insightful in understanding anxiety and the treatment process for it.

The discussion started with an introduction to anxiety, how it is an emotion of false fear, and why the user needs to undergo and experience the emotion to overcome any anxiety related disorder.

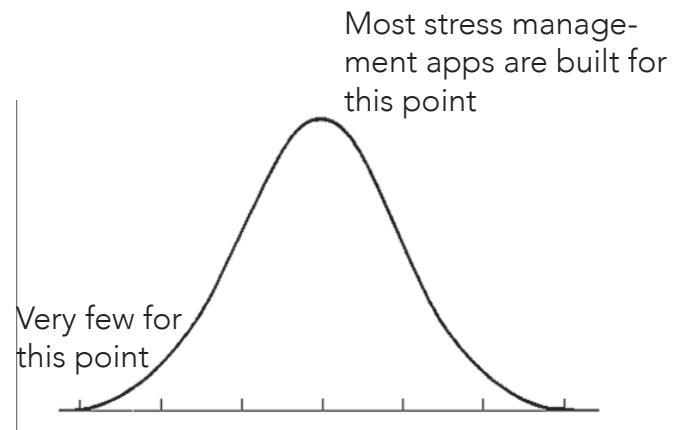
Since anxiety is generally caused by exposure to certain situations, events, or objects, escaping the situation provides an instant relief from the anxiety. People also develop safety behaviours as a response to such situations. Safety behaviours reduce the level of stress during such events. For example, for someone with social anxiety disorder, staying on the phone, not talking to many people, or avoiding interactions can be safety behaviours in a party that they have to attend.

But when an individual undergoes therapy for



**Title : Exposure therapy curve**

Source : [working-minds.co.uk](http://working-minds.co.uk)



**Title : Stress level**

Source : Author

such disorders, exposure and undergoing the full extent of anxious emotions is advised, as not relying on safety or escape mechanism allows the individual to understand his emotions better, reducing the severity of anxiety overtime.

This process leads to “cognitive restructuring”, where individuals can view their emotions more objectively overtime. They realize that the cause of anxiety is overestimation of probability of bad things happening.

Apart from CBT , other methods of treatment also exist, like thirdwave treatment, Acceptance and commitment therapy, and DBT, but CBT has most scientific research behind it.

Hurdles faced in treatment include :

- Getting people to come regularly to therapy. Sometimes they need to involve families and friends of the patient to maintain regularity.
- Getting people to do the home tasks as assigned for CBT. Due to multiple reasons, a lot of people don't take home tasks seriously.
- Self monitoring is not accurate as patients generally try to recall emotions before therapy sessions. Memory recollection is not accurate.
- During home assignments exposure therapy, therapists have to follow up using

normal messaging and communications apps, which becomes a inconvenient and tough.

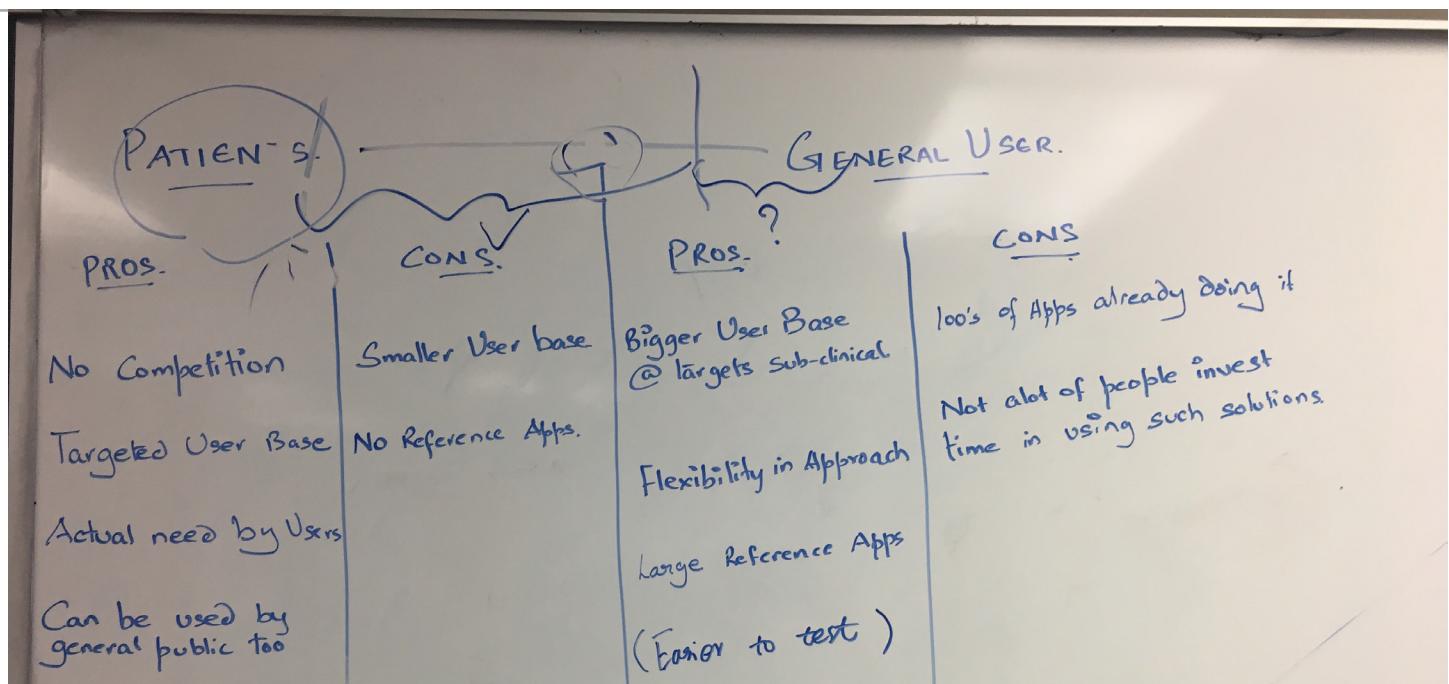
- There's no software to track patient progress regarding homework, or progress that fits in the treatment workflow.

03

## ANALYSIS

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# Research & Competitive Analysis



Title : Choosing product direction

Source : Author

After analyzing the information from the literature and interviews, we were faced with a huge decision. We could either design for people with sub-clinical anxiety, which had a bigger user base but quite a lot of applications as competitors, or design for people with clinical anxiety, and undergoing treatment. Through

the interviews, we could see a huge gap in the professional mental health treatment, which our product could cater to. The challenge was that it would require extensive research, and very few products could be used to learn from for competitive analysis. We decided to go with the 2nd option, and design for clinical treatment.

## Direct Competitors



Simple Practice is a management tools for therapist to manage practices. And it provides full security on patients' treatment progress. It also focus on billing and insurance, which makes therapists easier to manage their business.



TherapyNotes helps behavioral health professionals. It has tools that therapists need to manage patient records, schedule appointments, create documentation, bill insurance, and technical support. It has streamlined software including mobile applications.



TheraNest is a tools that designed for BHR. It contains primary features such as callendar, clients management, notes and billing. Other than that, it is also a tool designed for an organization to manage their whole business.



TherapyAppointment is file management software that allows therapists to manage a paperless practice anytime, anywhere, from any electronic device.



KareoKareo is a software as a service for independent medical practices. It offers a cloud computing products and services for electronic health record (EHR) management, medical practice management software, medical billing services (revenue cycle management), and software to help practices engage with their patients.



CounSol.com helps the practitioner run his practice easy, organized and secure. It provide basic management tools for practitioners and offer online sessions.

Competitors	Simple Practice	Therapy Notes	Counsel	TheraNest	Kareo	Therapy Appointment
Target Users	Parctitioner	Therapists	Consultant	Therapy Organizational	Independent Therapists	Therapists
Schedule						
Callendar Appointment management						
Treatment Process						
Treatment Record Patient Notes Reminder Patient Data Analysis Track Patients' Homework Activity Record						
Customer Management						
Contact Info Message Email Management						
File Management						
Document Storage Media Recordings Share Documents Custom Form						
Billing						
Billing Insurance Data Analysis on Revenue						
Functional Features						
HIPAA Desktop Mobile Device Patients' Device Staff Management						

## Key Takeaways

Software that the market have focus on practitioners work managment. Most of the products have basic features as follows,

- Calendar, Schedule Management
- Treatment Record
- Patient Management
- Message, Email
- Billing
- File Management

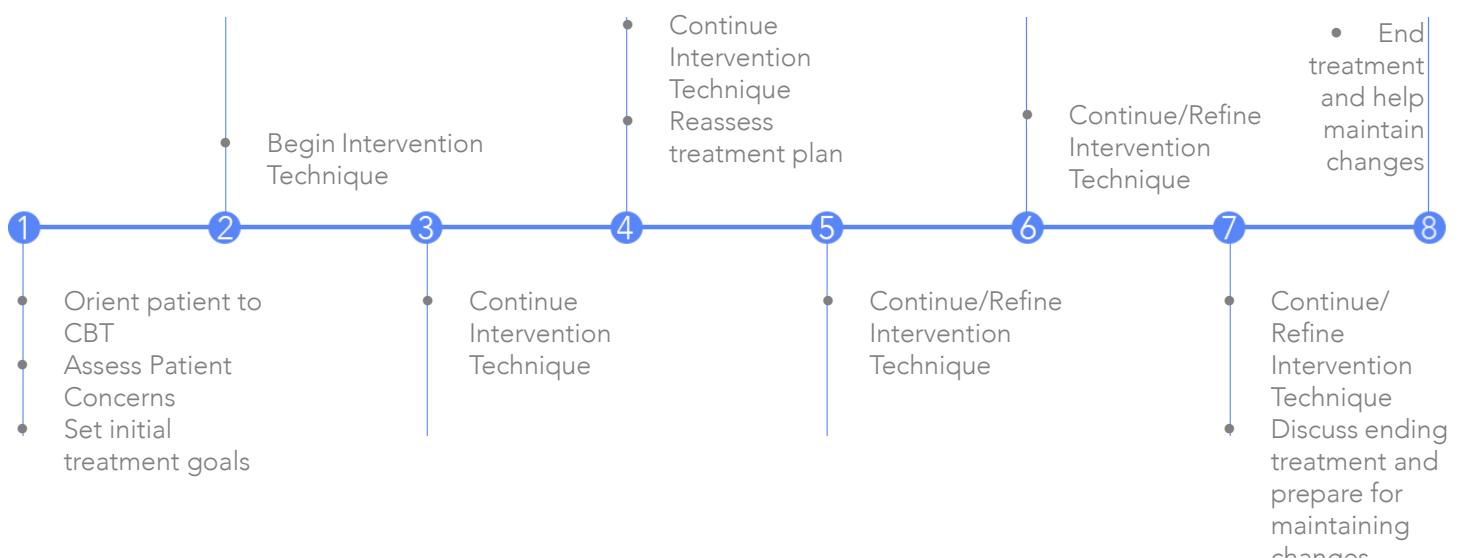
However, the main painpoints we developed from our research and interviews is the hardness to track with patients homework.

And most of them focus on therapist side, but the treatment progress require a two-people interaction. Therefore, it's necessary to consider on the patient side.

Based on that we want to create products not only include the primary features but more development on both patients side and therapist side, and provide useful data analysis to help them better coordinate with each other and improve the treatment progress.

- Data analysis on patients' homework
- Homework tracking system
- Easy access for patients to complete homework
- Homework guidelines
- Progress tracking

# User Journey and Personas



**Title : user Journey**

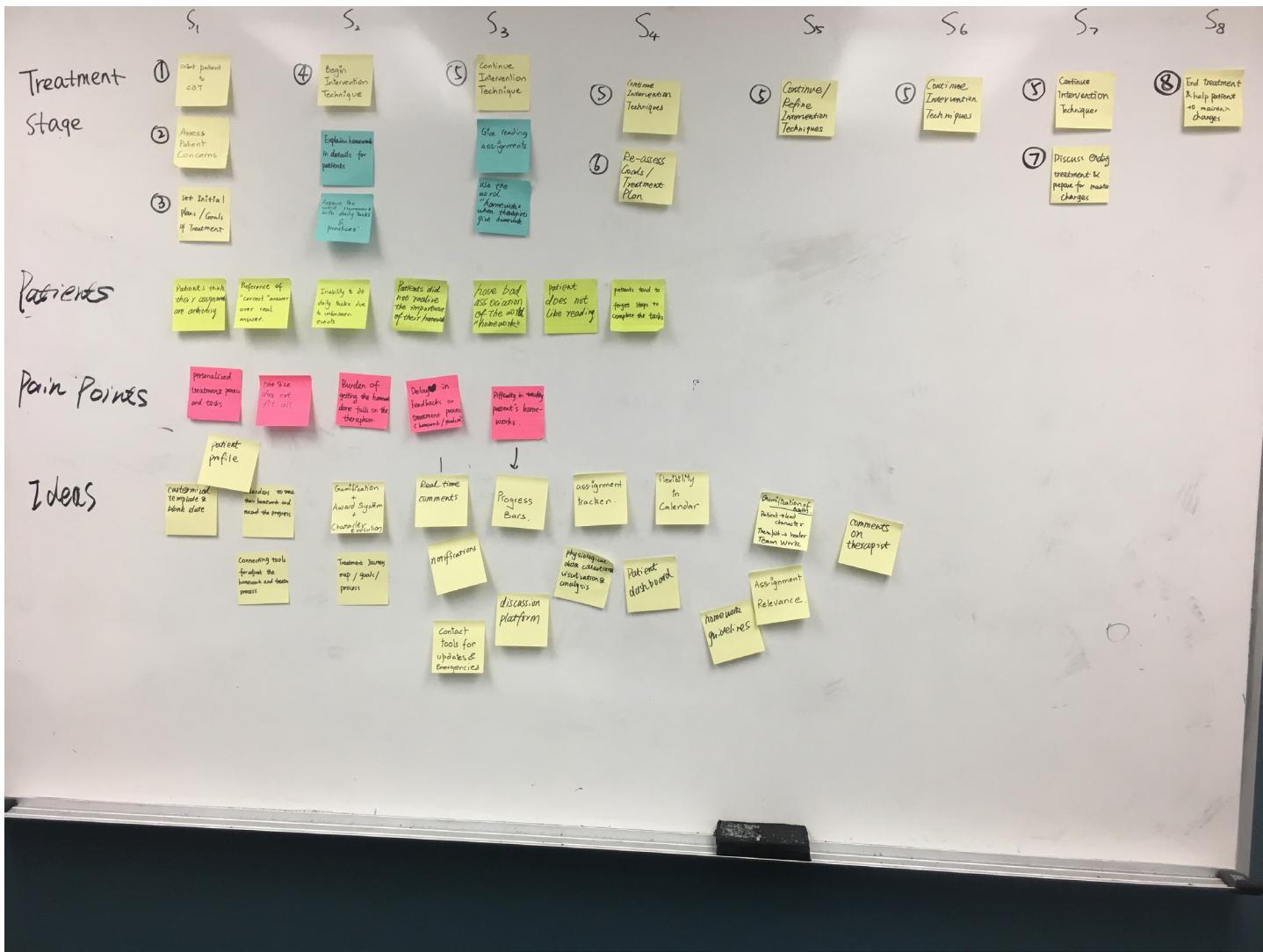
Source : Author

On the bases on the interviews with therapists and literature review, we created a user journey map. On a general level, all patients go through these 8 stages of treatment. A stage may take 1 or more sessions depending on individual patients.

To design for streamlining the process of

therapy, understanding the process from both therapists and patients side was very important.

Below the journey map, we charted out the common issues patients face with completing the assignments given to them during CBT. Common reasons that therapists hear from patients for not completing home assignments



## Title : User Journey and Pain Points

Source : Author

and other problems they face are:

- Patients think assignments are arbitrary
  - Patients try hard to give "correct" answer over real answer
  - Inability to do daily tasks and assignments due to unforeseen events like relatives coming over, office dinner, visit to parents house e.t.c.
  - Patients tend to forget the steps to complete a task, and complete half or not complete at all.
  - Have a bad association with the word "homework"
  - Patient does not like reading (for reading based assignments )

We also identified Pain Points - problems that Therapists face during the treatment process, which our product can target, and streamline the process making therapy more effective.

## Personalized treatment processes and tasks.

- One size does not fit all - Modification of assignments for different patients
  - Burden of getting the homework done falls on the therapist.
  - Delay in feedback on assignment/homework queries, slowing the treatment process.
  - Difficulty in tracking patient homework.
  - Thought record by patients is mostly based on recollection through memory, which is not very accurate.

# William, Mental Health Professional



"Patient care is my top priority."

**Age:** 42  
**Work:** Psychologist  
**Family:** Married, 2 kids  
**Location:** Austin, Texas

## Brands & Influencers



### Goals

- Provide better mental healthcare to patients.
- Help patients realize the importance of home assignments, and guide if needed.
- Help patients understand process and progress of treatment better, to get them more involved.

### Device Usage

Personal Computer (50%)

Tablet (25%)

Phone (25%)

### Frustrations

- Managing professional, social and personal life becomes hectic.
- Patient self reporting of emotions through recollection is not accurate. This slows down progress of therapy.
- Current appointment booking softwares are not intuitive, and using them feels a burden.
- Current appointment booking softwares are not intuitive, and using them feels a burden.

### Requirements

Manage patient schedule

Save patient information and therapy records

Track and manage patient progress

Track and analyze patient home tasks

Manage therapy files and resources

### Bio

Chopper has a busy schedule. To manage office, he has to use multiple portals to manage appointments, including an online software, mail and phone calls. The same holds true for giving patients tasks, and tracking its progress. He does not like being idle, and is always working or managing on the move, requiring to work from various devices like laptop, tablet, phone.

Spending time with family is also important, and he does not want to miss his kids big moments.

# Dan, Patient



"Life is full of challenges, which means it is full of opportunities of overcoming them."

**Age:** 28  
**Work:** Photographer  
**Family:** Single  
**Location:** Austin, Texas

## Brands & Influencers



### Goals

- Work with the therapist to get a better understanding of his treatment process
- Practice with the guide from his therapist to achieve the treatment goal

### Device Usage

Personal Computer (30%)

Tablet (30%)

Phone (40%)

### Bio

Dan is suffering anxiety disorder for five years since he graduated from college. He is sensitive and emotional. These characteristics help him capture great moments and scenes for his work but also brought some trouble in his life.

He always worries too much about everything. This affects his normal life a lot because of difficulty concentrating, feeling restless and having a sleep problem.

Dan is consulting his therapist to get over from his symptoms. He found it is helpful to learn how to control his emotion through treatment. However, he is too busy and forgets his homework sometimes. Also, he hopes to get to know his situation better to understand what is happening and deal with it.

### Requirements

work on homework

communicate with therapist when having doubts

track the physiological data

### Frustrations

- Having some doubts about homework sometimes
- Too busy and forgot completing homework
- Cannot get timely feedback from his therapist on homework

04

## IDEATION

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# Requirements & Ideas

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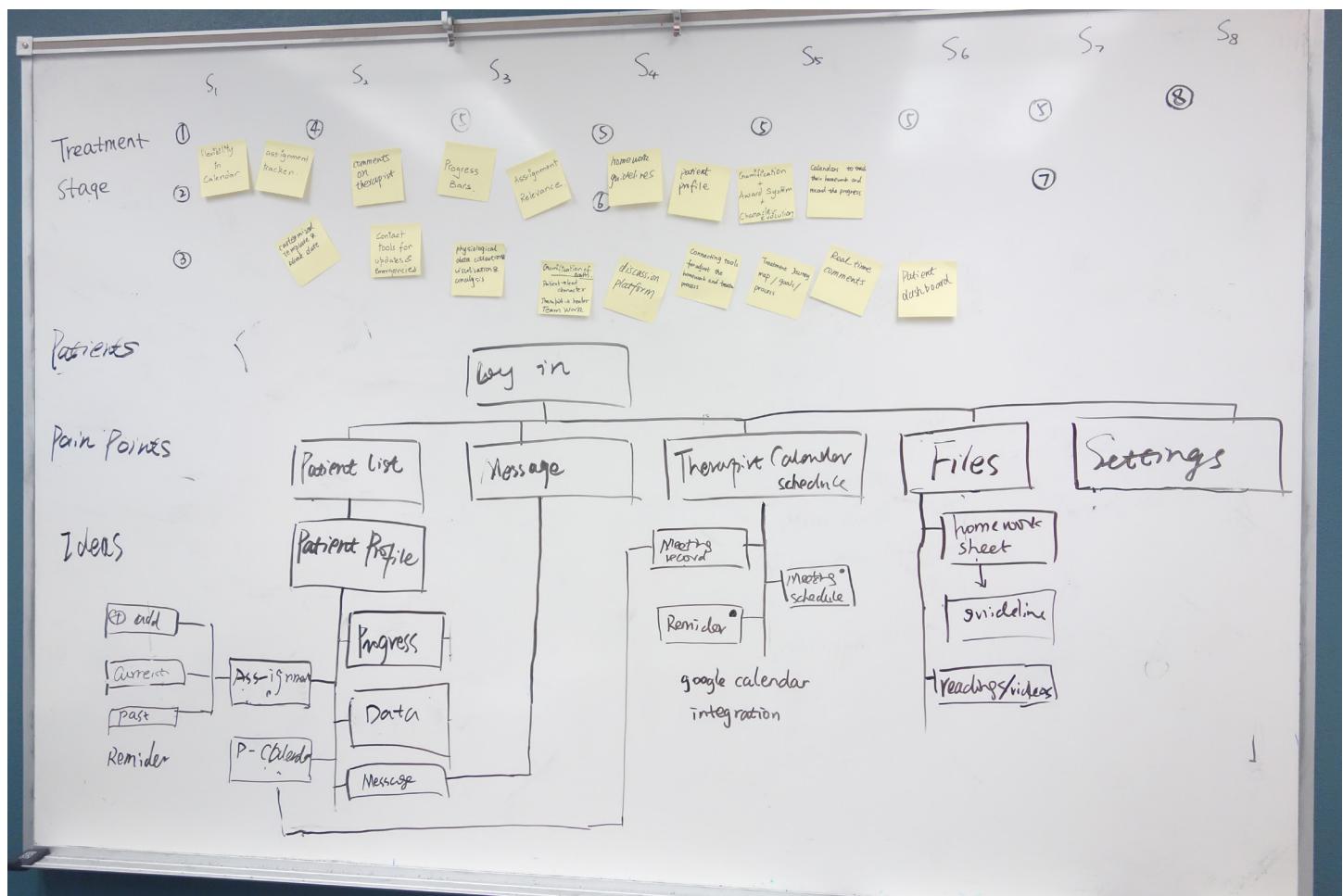
To fill the gap in the current therapy work-flow, to develop a product direction, we made a list of all ideas and features our product can have. These problems to solve were derived from analyzing user journey and pain points faced by the therapist as well as the user in the process.

The output of the brainstorming session was :

- Patient Profile
- Customizable templates and blank slides for homework assignments
- Gamification of process, Award system, and character evolution
- Connecting tools to update homework and progress status in realtime
- Calendars to record progress and track homework
- Treatment journey map , with goals and process
- Real time comments on files/assignments
- Progress Bars
- Discussion Platform
- Contact tools for update emergencies
- Assignment tracker
- Physiological data collection, visualization,

- and analysis
- Notifications
  - Patient dashboard
  - Flexibility in calendar/progress tracker
  - Homework guidelines
  - Assignment relevance
  - Automatic reminders

# Information Architecture



Title : Information Architecture

Source : Author

05

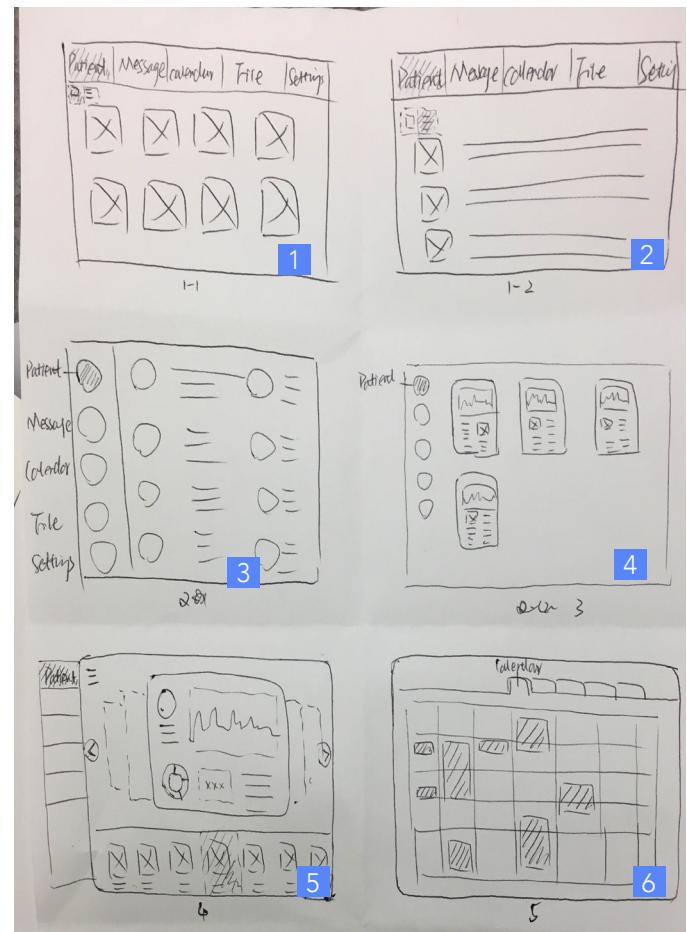
## DESIGN

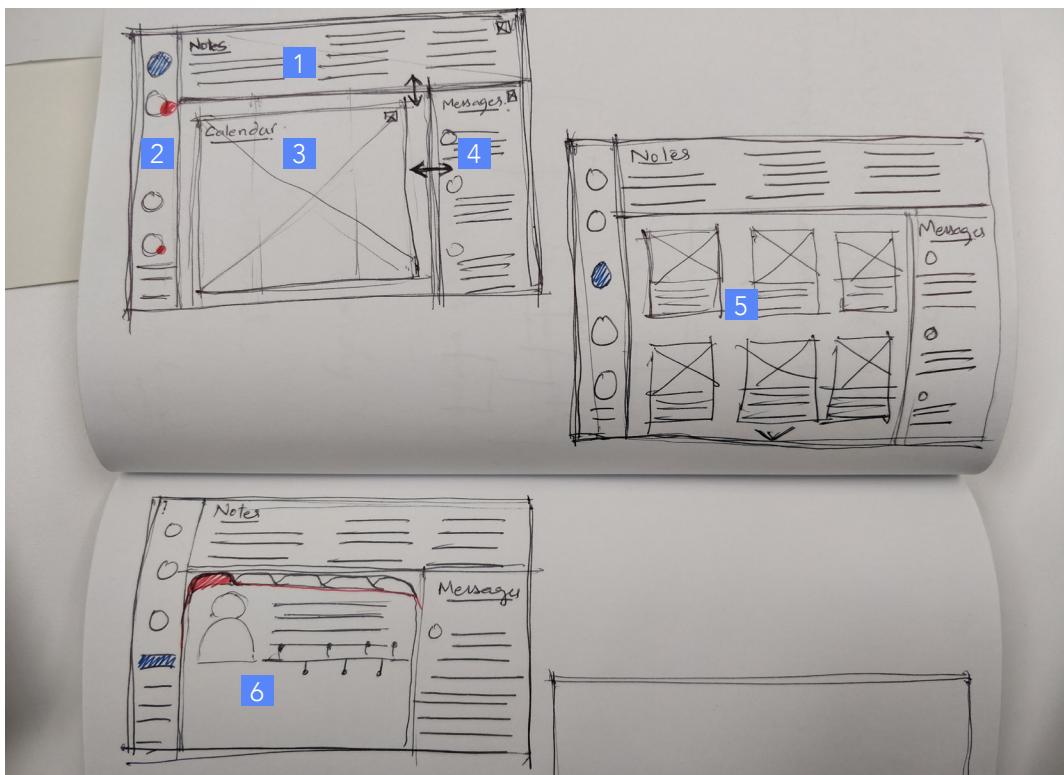
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# Low Fidelity Prototypes

Next step was to sketch ideas for how we were visualizing the ideas in our head. Each of us sketched as many ideas we could individually, and then discussed them all, explaining the pros and cons of each. Even with different people's multiple ideas, a pattern started to emerge, and further refinement lead to initial wireframe sketches.

- 1 Card view of patient list
- 2 List view of patient list
- 3 Messaging list
- 4 Patient Cards with data
- 5 Patient Pages navigation
- 6 Calendar view

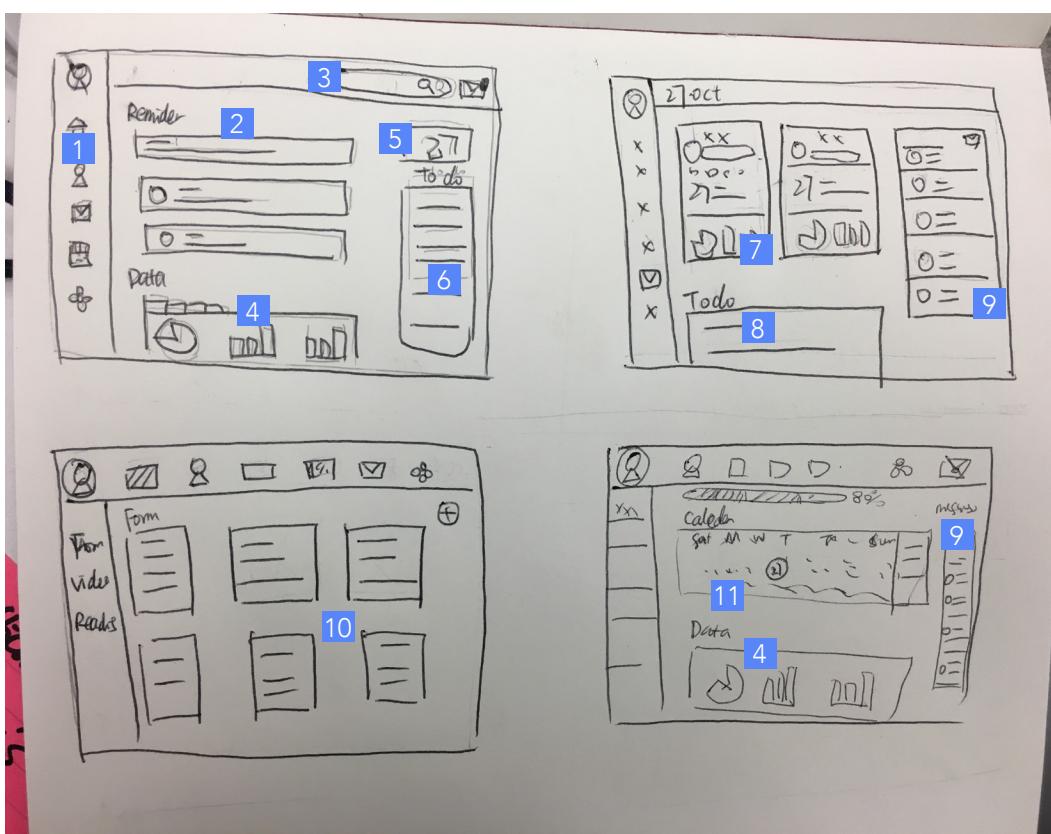




- 1 Notes tab
- 2 Navigation bar
- 3 Calendar Schedule
- 4 Messaging Tab
- 5 Patient List
- 6 Patient Details

### Title : Learnings from Interview 1

Source : Author



- 1 Navigation bar
- 2 Reminders
- 3 Search Bar
- 4 Patient Data
- 5 Todays Date
- 6 To do list
- 7 Patient Information Cards
- 8 To do List
- 9 Messages
- 10 Homework Templates
- 11 Calendar

### Title : Learnings from Interview 1

Source : Author

# Middle Fidelity Prototypes

The prototype consists of a main content area and a left navigation bar. The content area includes sections for Upcoming Patients, Finished Patients, a Schedule, a Note card, and a Messaging tab. The left navigation bar lists various functions: Overview, Patient, Files, Message, Notes, and Settings.

- Overview**: Shows a list of upcoming patients with their names, appointment times (e.g., 10:00 AM – 11:30 AM), and a placeholder text block.
- Upcoming Patients**: A section showing two patient entries. Each entry contains a patient name (Donna Al\*\*\*\*\*), appointment time (10:00 AM – 11:30 AM), and a placeholder text block.
- Finished Patients**: A section showing two patient entries, identical to the Upcoming Patients section.
- Schedule**: A daily schedule from 7 AM to 5 PM. A specific slot at 11 AM is highlighted with a green background and contains placeholder text.
- Note**: A quick note card with a placeholder text block and a list of truncated notes.
- Messaging**: A messaging tab with a placeholder text block.

1 Left Navigation Bar

2 Patient Appointment Card

3 Today's Schedule Card

4 Quick Notes Card

5 Messaging Tab

**1** Top Functions Bar

**2** Calendar Overview Card

**3** Patient Filter Card

**4** Main Calendar

Title : Learnings from Interview 1

Source : Author

**1** Patient List

**2** Password Lock

**3** Patient Data Charts

**4** Patient Progress Bar

**5** Patient Calendar

Title : Learnings from Interview 1

Source : Author

**Patient**

Sorted by

- Donna Alvarez  
Anxiety Disorder
- Mark Lane  
Anxiety Disorder
- Jordan Thomas  
Anxiety Disorder

Name: Donna Alvarez 1 Category: Anxious Disorder

Gender: Female

Age: 32

Contact: 0-(070)043-4928

Email: ftaylor@blogtag.edu

**Data**

Anxiety Level Muscle Tense Heart Beat Brain Wave

Hour Day Week Month

**Progress**

Date	Session	Description
12.11	Session 5-3	Treatment Completed
12.1	Session 5-2	
11.23	Session 5-1	
11.20	Session 4-3	
11.9	Session 4-2	
10.15	Session 4-1	
10.9	Session 3-2	
10.2	Session 3-1	
9.27	Session 2-2	
9.23	Session 2-1	
9.27	Session 1-3	

## 1 Patient Details

>Password protection to view patient details. This is done to protect patient data privacy. The system would require re-authorization every 30 min.

Title : Learnings from Interview 1

Source : Author

File > Homework

4

**1 Document**

**2 Add New Document**

**3 Homework Document Templates**

**4 Search Bar**

Homework Template

- Reading 1
- Lorem ipsum d...
- Lorem ipsum d...

2

3 Daily Mood Scale

Thoughts Track

Daily Mood Scale

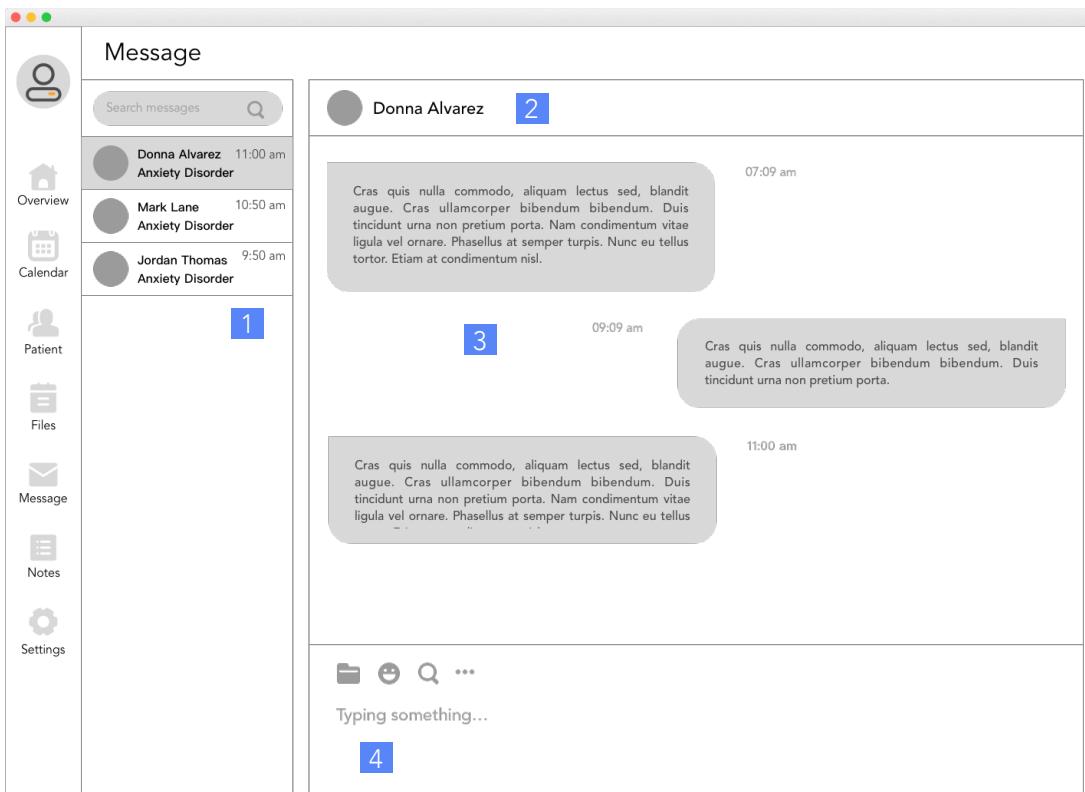
Daily Mood Scale

Daily Mood Scale

Messaging

Title : Learnings from Interview 1

Source : Author



- 1 Patient List
- 2 Current Patient
- 3 Chat Window
- 4 Type Window

**Title : Learnings from Interview 1**

Source : Author

06

## USABILITY TESTING

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Usability Testing was carried out in 3 stages, with a total of 2 psychologists in person, and 12 individuals working in the healthcare industry online, using UserTesting.com.

The responses were critical in fine tuning the prototype to better serve the users we were designing for. The key results of the testing were :

### In-Person Testing

#### 1) Jolene Jacquart :

- Patient dashboard should show questionnaires like BDI and OASIS scores for quick overview.
- Should not use real patient names on Calendar view. Use codes instead to protect privacy.
- The anxiety graph should have the feature of highlighting sections of data that correspond to patients doing the home tasks given by therapist.

- Patients should be shown their progress bar update as per therapist's decision, and not in real time.
- Messaging feature should also be password protected, as it would also contain sensitive information.
- Homework assignments should be mobile-friendly for the patients.
- Integration with Redcap and Qualtrics would be useful in making homework assignments and tracking results.
- Therapists should be able to see patients view of the document too.
- Homework assignments should have flexible automatic reminders with them.
- Homework assignments should have recurring option, if the same assignment needs to be done repeatedly.
- Notes are of two types, general notes, and medical records. A therapist makes both kinds of notes in a meeting. Medical records are highly sensitive, and should not be easily accessible.

- Application can set some boundaries in messaging section, because the Therapist cannot be available 24X7.
- The patient should understand its for important messaging only, and immediate response is not guaranteed. In case of emergencies like suicidal thought, the app should re-direct/inform patient to emergency helpline number specially made for such situations.
- Visual indicators on calendars can show patients that are not doing well. Patients with no improvement in test scores overtime can be flagged and highlighted to the therapist .

After implementing the comments from Jolene, another round of usability testing was done with Santiago, to further refine the product.

## 2) Santiago Papini :

- Initial impression of the overview page was good. Clean, and organized, with important information for the day being displayed.
- Visual aspects are appealing. User interface is very intuitive, well organized, and easy to use.
- Much better than the
- The idea of using colored dots to display patient progress status is good. If a number inside the dot shows the increase/decrease in test scores, it would be more useful in categorizing patient in severity levels.
- Anxiety graphs can be more detailed, with cut off lines for various anxiety level indicators.
- Patients can be sorted using phases of treatment they are in.
- Patient details and access would need to adhere to HIPAA requirements.
- Documents would be better if categorized by Domain. ( disorder type )
- Patient profile --> patient detail card contains too much identifying information. Photo is not required, and contact details should have another level of password

security on them. Without password, the card can show summary of diagnosis, summary of no. of sessions, and therapy start date.

## 3) UserTesting.com :

- Overview page is a bit overwhelming. Patients' profile is not easy to see which one is upcoming and which one is completed.
- Patients profile is listed useless information.
- Notes in the overview page is not clear to see its category.
- Homework tracking is not obvious.
- Physical data is a little confusing. I don't know what to do with that.

07

## Final Design

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Overview

Appointments 6 | Remaining 3 | Completed 1 | Canceled 1

**Appointments** 6 < December 6 > +

Patient Name	Diagnosis	Appointment Details	Status
Grace G***	Social Phobia	3:00 - 4:00 PM Upcoming Session 5/7 Questionnaires PHQ-9 14 OASIS 12	Upcoming
Charles S***	Depression	10:45 - 11:30 AM Upcoming Session 6/7 Questionnaires PHQ-9 10 OASIS 7	Upcoming
Teresa B***	OCD	11:45 AM - 12:15 PM Upcoming Session 3/8 Questionnaires PHQ-9 19 OASIS 17	Upcoming
Jonathan R***	Anxiety Disorder	1:00 - 1:30 PM Upcoming Session N/A First appointment Questionnaires N/A	Upcoming
Kevin P***	Panic Disorder	1:50 - 2:30 PM Cancelled N/A	Cancelled
Donna A***	Anxiety Disorder	9:00 - 10:30 AM Completed Session 5/8 Questionnaires PHQ-9 10 OASIS 11	Completed

< December 6 >

7 AM  
8 AM  
9 AM  
10 AM Appointment with Charles  
11 AM Appointment with Donna  
12 AM Appointment with Teresa  
1 PM Appointment with Jonathan  
2 PM Appointment with Kevin  
3 PM Appointment with Grace  
4 PM +

Thursday

Check patients' homework.  
Call Jingyi to reserve lab.

Title : Patient Overview Page

Calendar

December 2018

S	M	T	W	T	F	S
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Add a Calendar +

Patients Sort by Session

- JD-2345
- SJ-1303
- YQ-0208
- MM-1213
- JC-1216
- AS-0208
- IK-2456

Calendars

- Therapist Association
- Google

Sunday Monday Tuesday Wednesday Thursday Friday

18 19 20 21 22 23

1am  
2am  
3am  
4am  
5am  
6am  
7am  
8am Conference 3.240 A  
9am Appointment with IK-2456  
10am Appointment with As-0208  
11am Appointment with As-0208  
12pm Appointment with As-0208  
1pm  
2pm

Title : Calendar Page

Documents > Homework

Anxiety

Homework

- Exposure Tracking
- Thought Forecasting
- Identifying AT
- Core Belief
- Positive Belief
- CBT for Anxiety
- My Strengths
- Recognizing Stress
- Distress Tolerance
- Handouts
- Questionnaires
- Depression
- PDST
- Eating Disorders

Homework

Homework	Last given
Exposure Tracking	Dec 4, 2018
Thought Forecasting	Dec 4, 2018
Identifying AT	Dec 1, 2018
Core Belief	Dec 1, 2018
Positive Belief	Dec 4, 2018
CBT for Anxiety	Dec 4, 2018
My Strengths	Dec 5, 2018
Recognizing Stress	Dec 1, 2018
Distress Tolerance	Dec 1, 2018

Title : Homework Template Page

Documents > Homework > Thought record

Sort by symptom ▾

- Donna Alvarez Anxiety Disorder
- Azar Hosseini Anxiety Disorder
- Leo Knight Anxiety Disorder
- Waiano Akarana Anxiety Disorder
- Leonetta Lloyd Anxiety Disorder
- Shen Zhi Anxiety Disorder
- Chigusa Kisa Anxiety Disorder
- Izumi Katsuyoshi Anxiety Disorder

## Identifying AT

### Identify Automatic Thoughts

#### Homework Introduction

Our thoughts control how we feel about ourselves and the world around us. Positive thoughts lead to us feeling good and negative thoughts can put us down. Sometimes our thoughts happen so quickly that we fail to notice them, but they can still affect our mood. These are called automatic thoughts. Oftentimes, our automatic thoughts are negative and irrational. Identifying these negative automatic thoughts and replacing them with new rational thoughts can improve our mood.

**Peter**

Remember, if you list more than one mood in question 2, mark the mood you want to put under the microscope. Use the questions at the bottom of question 3 to help you identify the thoughts connected to the mood you marked.

Remember, you do not need to answer every question in question 3. Ask yourself the first two general questions, and then some or all of the questions specific to the moods you circled or marked in question 2.

**1. Situation**

**Peter**

Who were you with?  
What were you doing?  
When was it?  
Where were you?

Patients > Donna Alvarez

Enter Password

**Title : Homework Coordination Page**

**Patient Profile Locked Page**

**Patients > Donna Alvarez**

Authorization required in 15 min

Search here

**Donna Alvarez** | Anxiety Disorder

Age 30 Gender Female

Contact 0-(070)043-4928

Email ftaylor@blogtag.edu

Address 1802, West Avenue, Austin, 78701

Differently concentrating, muscle tension, sleep difficulties. Endured abuse and witnessed traumatic events in childhood. Drug and alcohol misuse. Cured food addiction and sex addiction two years ago.

**Anxiety**

Clinical Cut-off for Anxiety Disorder

**Homework**

Clinical Cut-off for Panic Disorder

**Heartbeat Muscle Tension Brain Waves**

Identify Automatic Thoughts

**Session 9**

Meeting 5-1 28 Nov  
Check mood  
Discuss progress of therapy and termination  
Review homework  
Introduce cognitive distortions

**Session 8**

Meeting 5-2 3 Dec  
Introduce concept of challenging hot thought.  
Homework: relaxation techniques  
1 three-column thought record  
Receive feedback

**Session 7**

**Session 6**

**Session 5**

Meeting 4-1 8 Nov  
Check mood  
Review imagery  
Introduce three-column thought record and idea of "hot thought." Practice three-column with event from past week

**Session 4**

Meeting 4-2 19 Nov  
Check mood  
Homework: relaxation technique  
Receive feedback

**Session 3**

Meeting 3-1 18 Oct  
Problem-solving skills  
Relaxation skills

Meeting 3-2 24 Oct  
Continue Intervention Techniques  
Set homework: Plan two times during week to practice progressive muscle relaxation.

Meeting 3-3 1 Nov  
Check mood  
Review progressive muscle relaxation  
Introduce and practice imagery

**Session 2**

Meeting 2-1 28 Sep  
Re-assess Patient's Concerns

Meeting 2-2 3 Oct  
Begin Intervention Techniques

Meeting 3-3 10 Oct  
Check mood  
Begin Technique Maladaptive thoughts, behavioral activation  
Receive feedback

**Session 1**

Meeting 1-1 10 Sep  
Orientation to CBT  
Assess Patient's Concerns

Meeting 1-2 18 Sep  
Set Initial Treatment Goals

Meeting 1-3 21 Sep  
Re-access concerns

**Calendar**

1	2	3	4	5	6	7
		Identify Automatic Thoughts				
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

**Title : Patient Profile Unlocked Page**

The screenshot shows the 'Messages' page. On the left sidebar, there are icons for Overview, Calendar, Patient, Documents, Message (which is selected), Notes, and Settings. The main area has a header 'Message' and a note 'Authorization required in 15 min' with a lock icon. A search bar at the top right contains the placeholder 'Search here'. On the left, a list of messages is shown, sorted by 'symptom'. Each message includes a patient profile picture, name, disorder, and a small colored dot indicating status (green, yellow, or red). The messages are:

- Donna Alvarez: Anxiety Disorder (green dot)
- Azar Hosseini: Anxiety Disorder (green dot)
- Leo Knight: Anxiety Disorder (yellow dot)
- Waiano Akarana: Anxiety Disorder (green dot)
- Leonetta Lloyd: Anxiety Disorder (green dot)
- Shen Zhi: Anxiety Disorder (red dot)
- Chigusa Kisa: Anxiety Disorder (green dot)
- Izumi Katsuyoshi: Anxiety Disorder (green dot)

The main conversation window shows a message from 'Donna Alvarez' at 11:00 am: "getting easier and easier." Below it, a response from 'Donna Alvarez' at 11:00 am says: "Sure! Thank you very much! I will!". Another message from 'Donna Alvarez' at 11:00 am reads: "And I am thinking, since I got more time recently during winter break, I am available to read more to speed up our treatment. Could you recommend more valuable readings for me?". A PDF file named 'PsychTools Unhelpful Thoughts Handout.pdf' (77 KB) is attached, with a note below it stating: "Turned it into homework." At the bottom, there are icons for folder, smiley face, star, and more options, followed by the placeholder text 'Typing something...'. A blue checkmark icon is visible near the attachment.

Title : Messages Page

The screenshot shows the 'Notes' page. The left sidebar includes icons for Overview, Calendar, Patient, Documents, Message, Notes (selected and highlighted in blue), and Settings. The main area has a header 'Notes' and a note 'Authorization required in 15 min' with a lock icon. A search bar at the top right contains the placeholder 'Search here'. On the left, a sidebar menu shows a tree structure of notes: 'Daily notes' expanded, showing 'December' expanded, showing 'Patient tracking' selected and highlighted in grey, and other months like 'November', 'October', 'September', and categories like 'Conference' and 'Other'. To the right, a section titled 'Patient tracking' lists tasks: 'Check patients' homework', 'Call Jingyi to reminder her today's meeting', and 'Send counseling treatment plan copy to Donna'.

Title : Notes Page

08

## Appendix

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## References

- [https://en.wikipedia.org/wiki/Mental\\_health](https://en.wikipedia.org/wiki/Mental_health)
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- <https://www.cl.cam.ac.uk/~cm542/papers/Ubicomp10.pdf>
- <http://www.working-minds.org.uk/documents/what-is-anxiety.pdf>

Link for complete prototype : <https://projects.invisionapp.com/prototype/Sense-i-cjpbtapl00gc6j013huy1030/play/86d29fe7>

