

Capstone Spring Semester

TENSE MED DYNAMICS



MEET THE TEAM



Ryan L
Cybersecurity Lead



Marco C
Technical Manager



Zach T
IT Lead



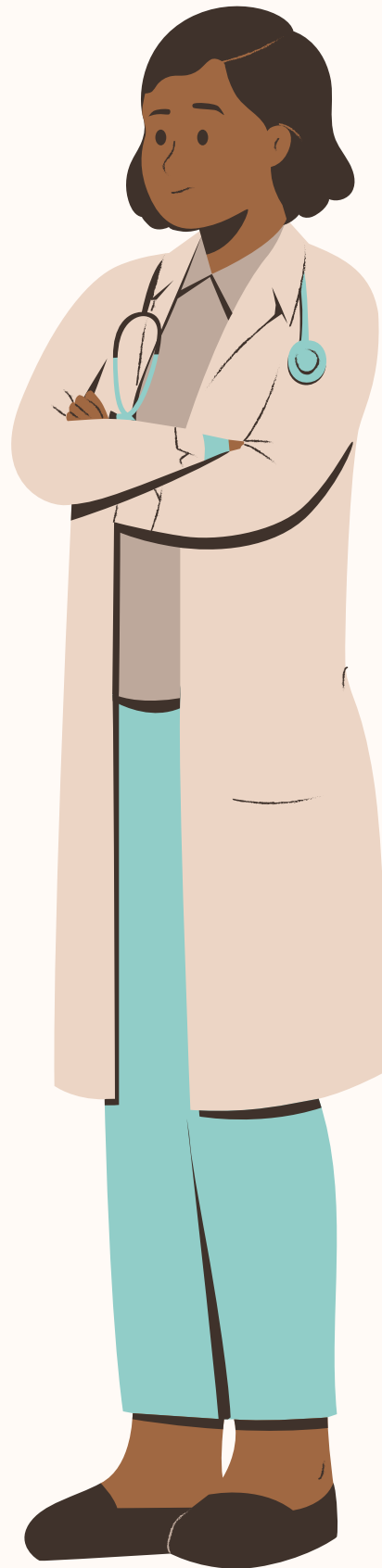
Cathy L
Project Manager



Paul D
Mentor



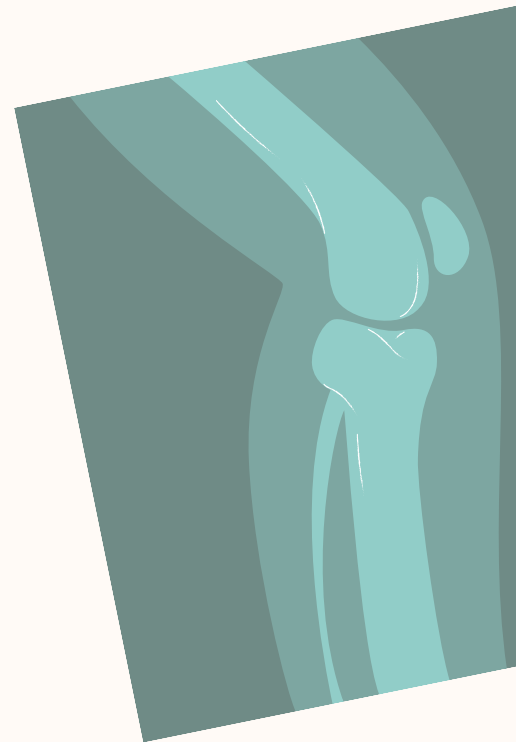
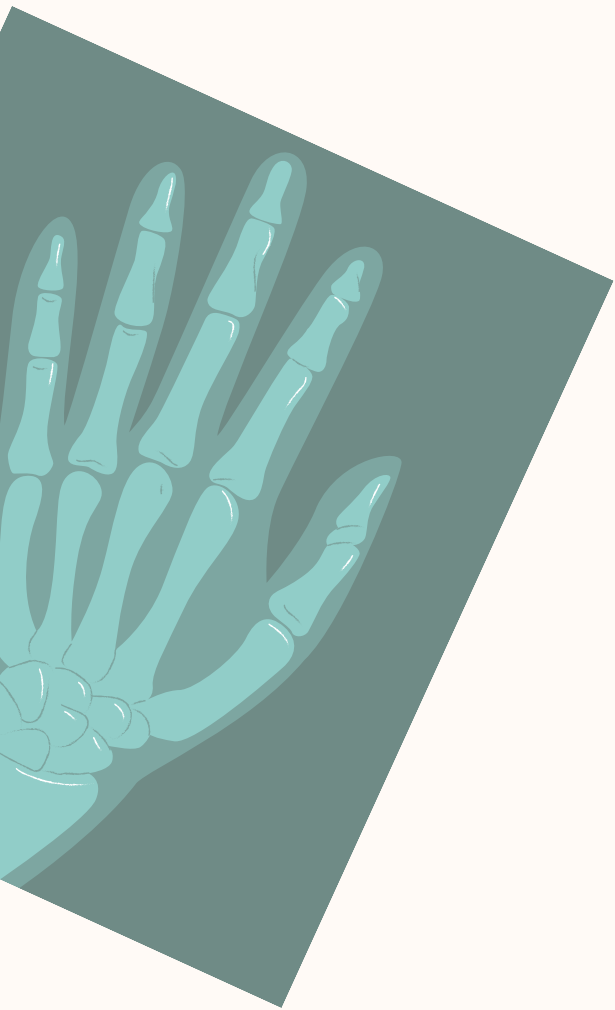
Jesslynn A
Client



WHAT IS...

PHOTOBIOMODULATION

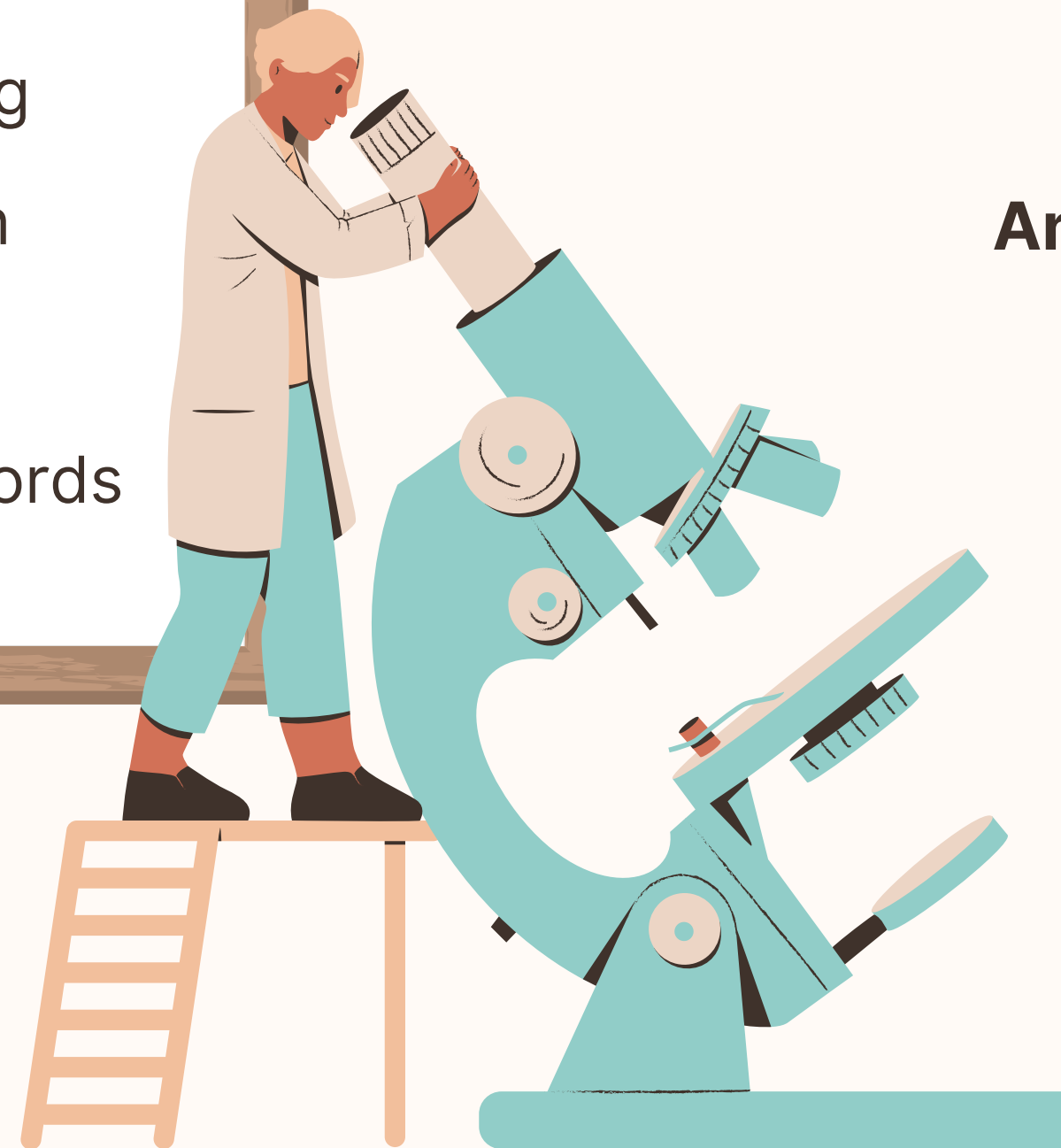
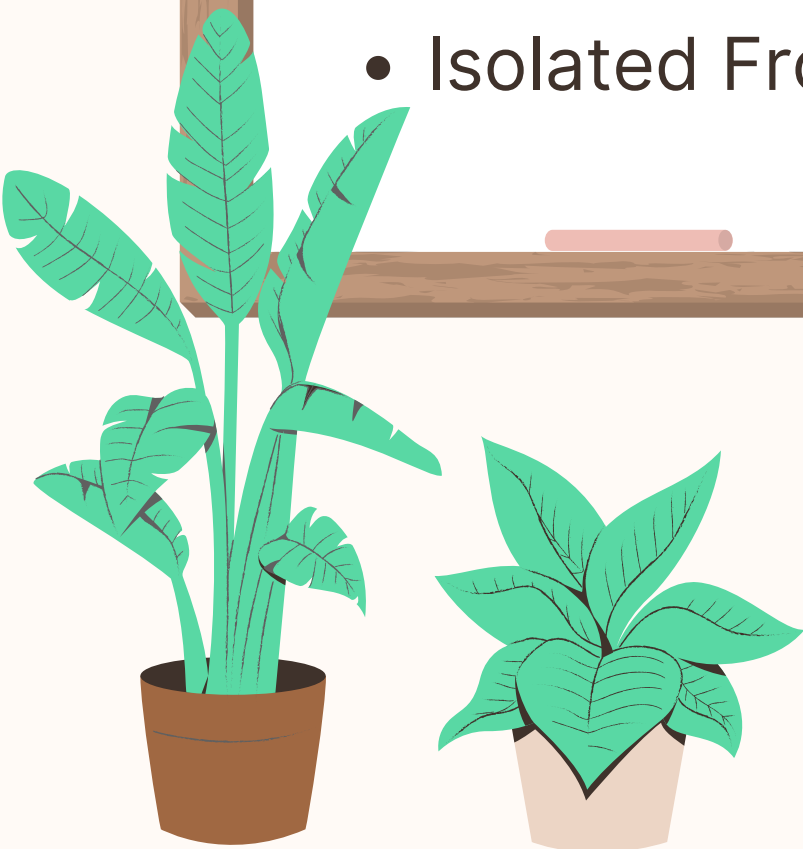
- Reduces Pain and Inflammation Naturally
- Speeds up Wound Healing and Tissue Repair
- Enhances Muscle Recovery and Performance
- Improves Circulation and Cellular Function
- Supports Brain Health and Cognitive Function




PROBLEM STATEMENT

- Current PBM Devices: Expensive or Low Quality
- Limited Patient Accessibility to Effective Therapy
- No Progress Tracking or Health Monitoring
- Poor Interfaces With No Digital Integration
- Lack of Secure Data Management
- Isolated From Comprehensive Health Records

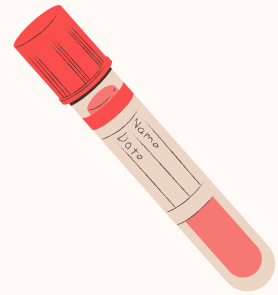
**An exploration of
innovations in
medicine**



SOLUTION OVERVIEW

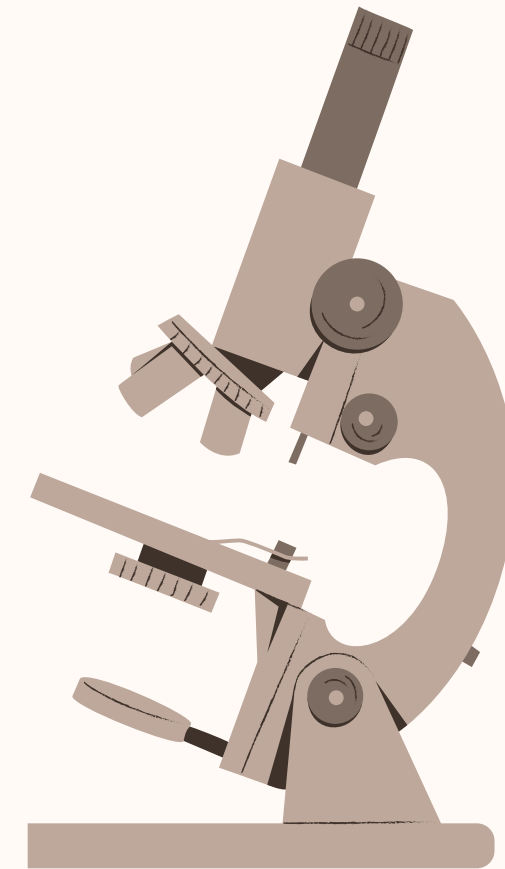
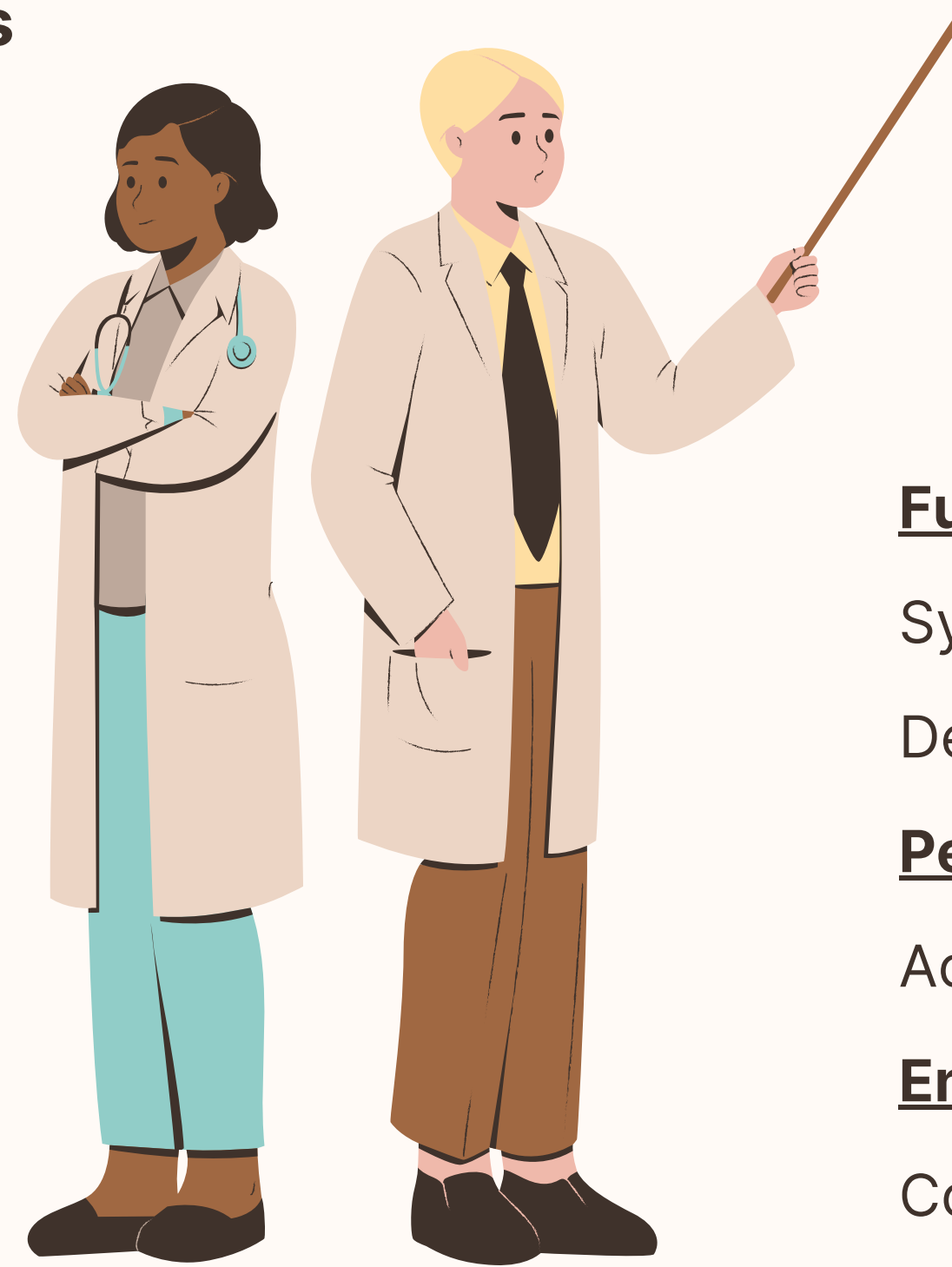
- 
- Compact & Wireless
 - Real-Time Biometric Tracking
 - Seamless App Integration
 - User-Friendly Interface
 - Secure Data Management
 - Scalable & Affordable

KEY REQUIREMENTS



User Requirements

- Secure Account System
- Real-Time Data Syncing
- Cross-Platform Accessibility
- Gamified User Engagement
- Strong Data Privacy



Other Requirements

Functional: Secure Login, Real-time Syncing, and Easy Access Across All Devices.

Performance: Speed, Accuracy, and Accessibility.

Environmental: Arduino Coding, Bluetooth Connection.

ARCHITECTURE

Layering approach

- **Presentation:** Flutter for UI
- **Business:** Flutter for Backend/API Call
- **Data:** Firestore to Manage Data

Bluetooth

- Client and Server Relationship
- Stream of Data
- Data Temporarily Stored on App



IMPLEMENTATION DETAILS

Firestore

- Built in Flutter API
- Store, Gather, and Modify
- NoSQL Database
- User Authentication
- Real-Time Synchronization

Stream-Based Control

- Full Control Over the Device
- Real-Time Data Gathering
- Change Treatment Pattern
- Signals for Unplanned Changes

Client-Server(thick client)

- Type of Networking
- App Gathers Data
- Locally Stores Data

Collection
XAXSDASFSFAFSA
DASFAFE223HJIHII

XAXSDASFSFAFSA
Weight
Hight
Age
DOB

DASFAFE223HJIHII
Weight
Hight
Age
Health Condition
Access Permission



PROTOTYPE VIDEO

Youtube Link:

<https://youtu.be/I2YZaUJNUrM>

A mobile app prototype for a 'Signup Form'. The form is displayed on a light purple background with a dark purple header. The form fields are: Owner Name (with a blue cursor), Email, Password (with a red error message: 'At least 8 characters', 'At least one uppercase letter', 'At least one lowercase letter', 'At least one number'), Confirm Password, Dog Information (Dog Name, Breed, Age (years), Weight (lbs), Gender (Male)), and a blue 'Sign up' button. The bottom of the screen shows a white keyboard with a blue 'Done' button and a blue 'Sign up' button. The status bar at the top shows the time as 9:09 PM and 42% battery.



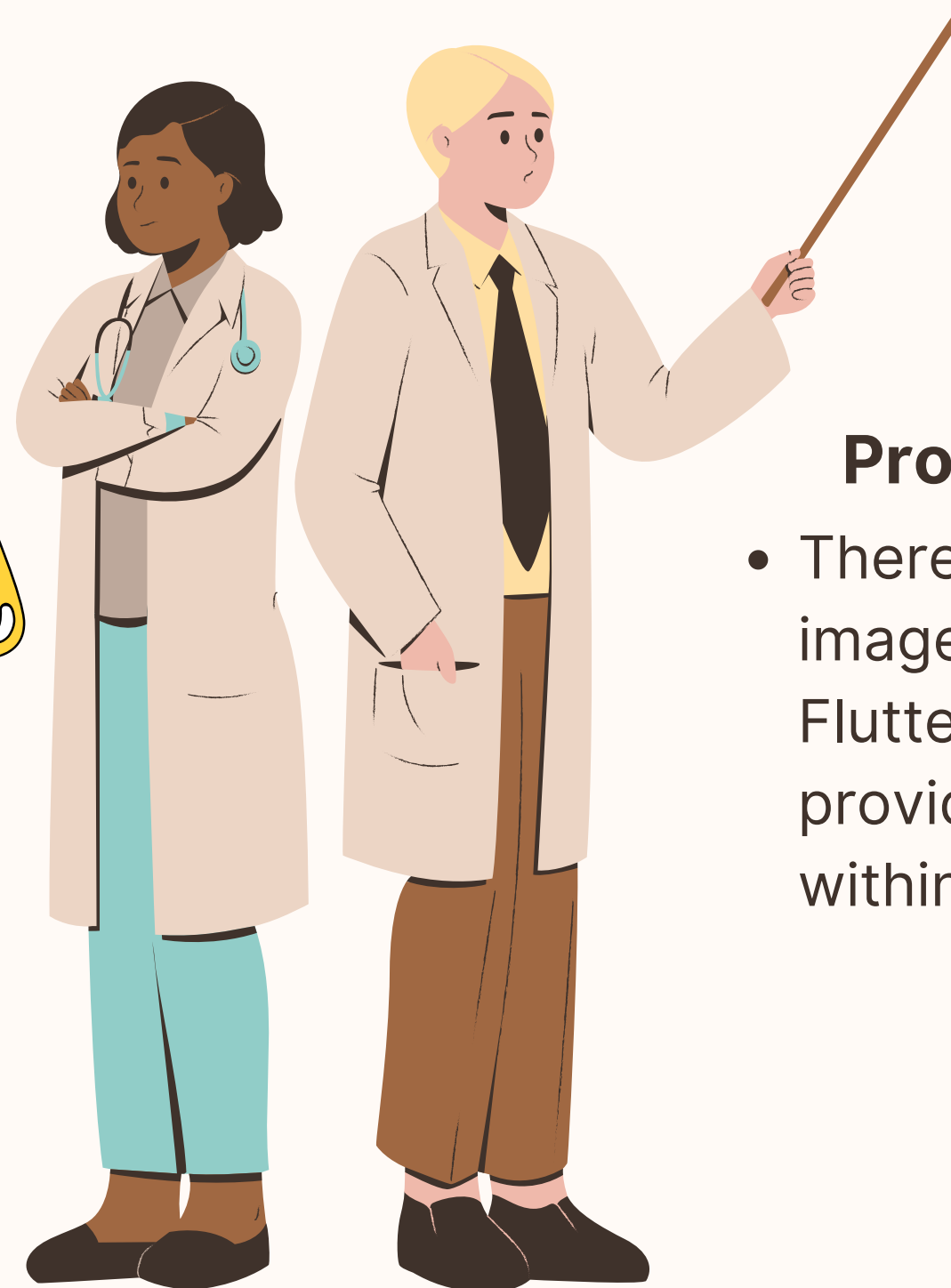
CHALLENGES AND RESOLUTIONS

Interdisciplinary Team Coordination

- Our team encountered challenges coordinating with EE and ME teams due to different timelines and priorities, so we had regular check-ins and shared documentation to stay on track

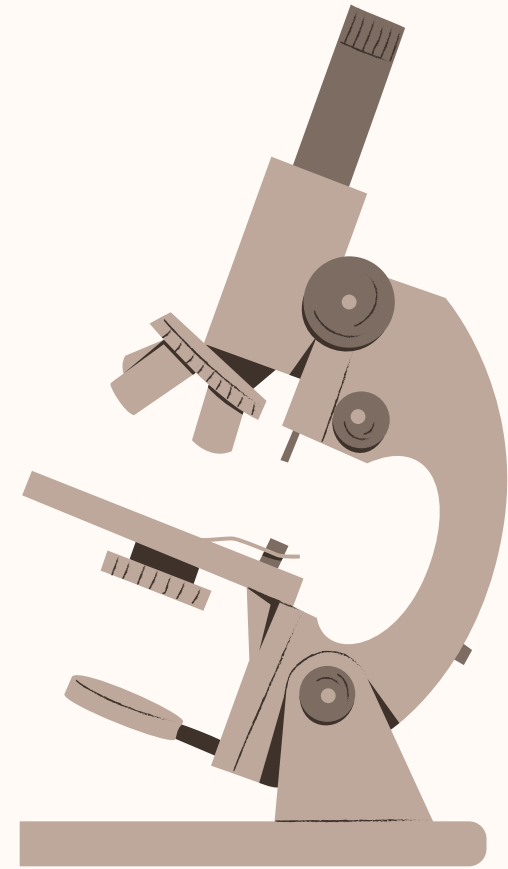
Gamification

- We struggled to add gamification without distracting from health goals, so we designed a motivating achievement system focused on therapy progress



Profile Picture Selection

- There were issues implementing image selection from local files in Flutter, so we compromised by providing a set of local images within the app for users to choose



TESTING PLAN

Unit

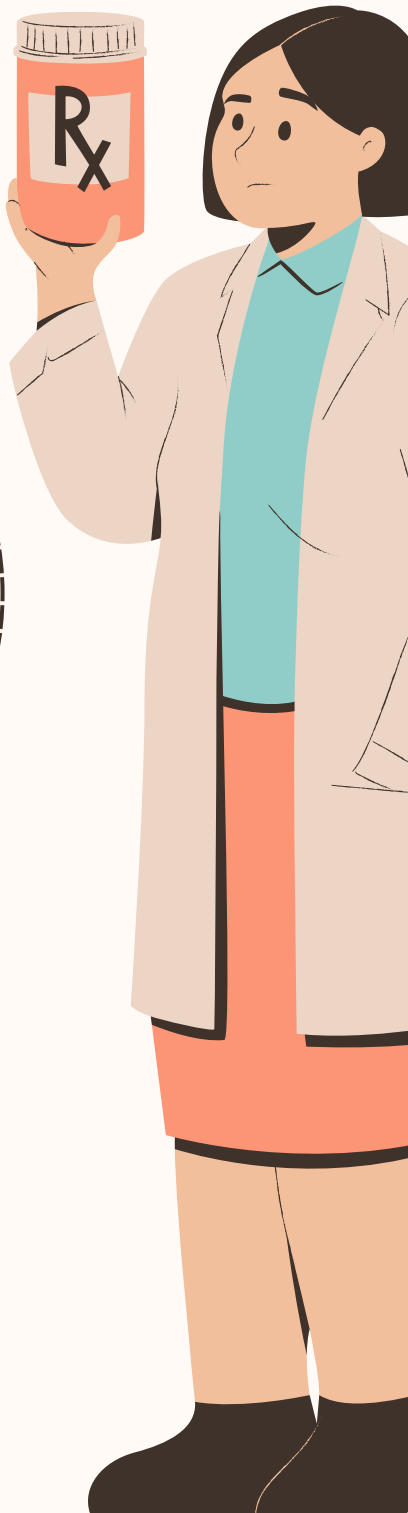
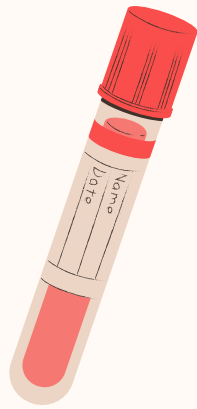
- Login Validation
- User Registration Process
- Database Interactions With Firebase/Firestore

Usability

- Interface Navigation
- Information Accessibility
- Expert Reviews
- Small-Scale User Testing

Integration

- Authentication-Database Integration
- Complete User Flow
- Bluetooth With Real-Time Data Validation
- Error Handling





SCHEDULE

Some changes since last time...

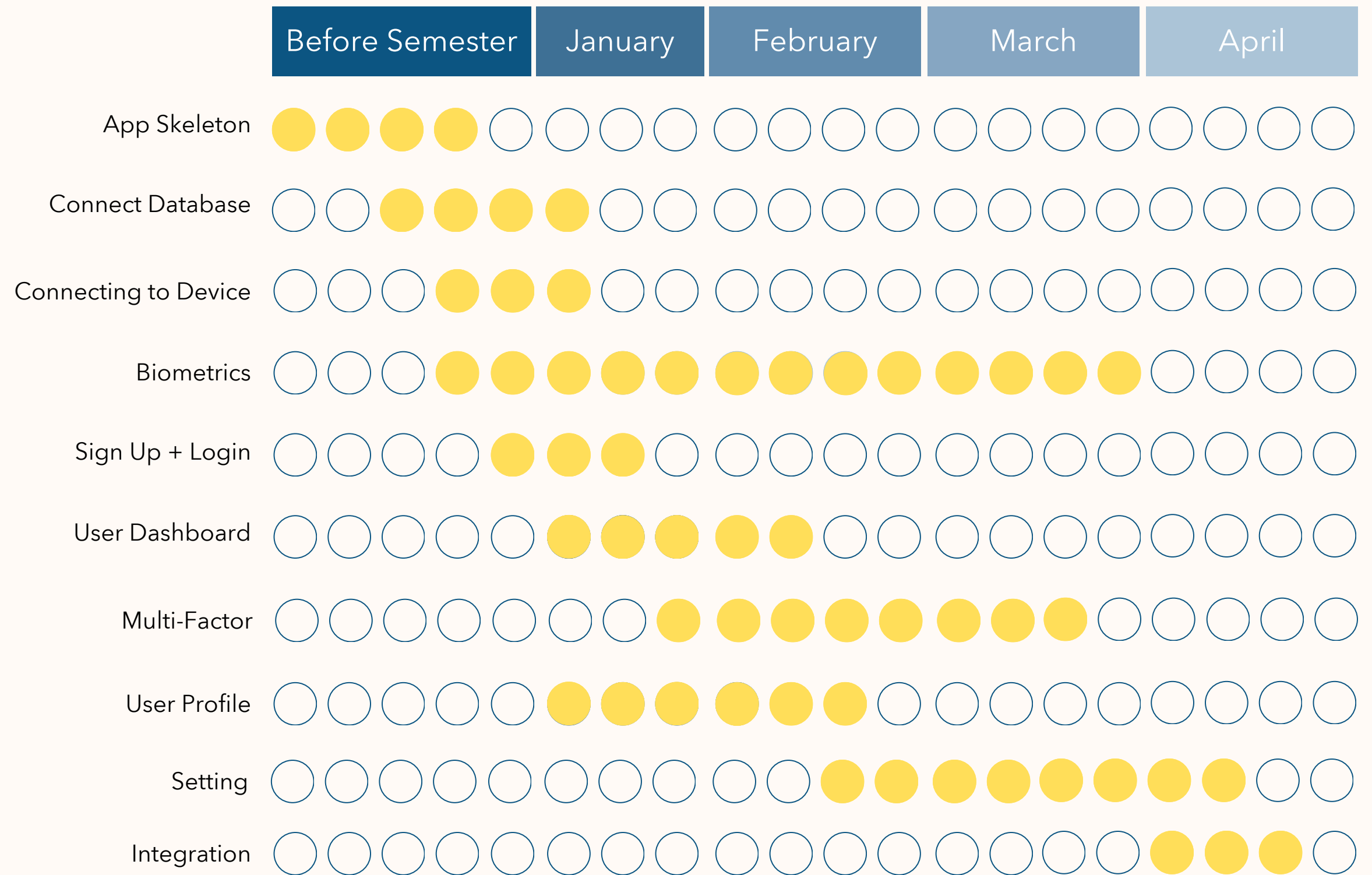
MVPs completed but need updated UI



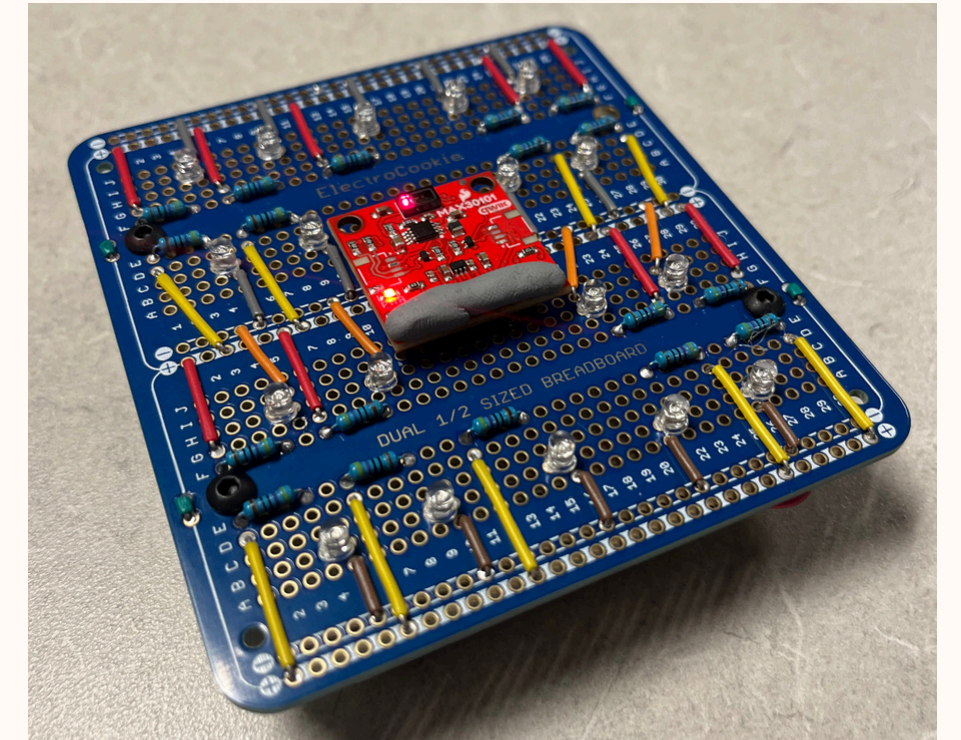
Gantt Chart

TenseMed Dynamics

Spring 2025



CONCLUSION



Key Points

- What's Wrong With Light Tech?
- What Is LightDose?
- How Are We Implementing?
- What's the Client's Feedback?
- What Is Our Impact?

The Progress

- What Are Our Next Steps as We Finish the Project?
- What Impact Will LightDose Have On PBM Therapy and Healthcare?

THANK YOU FOR YOUR ATTENTION

