Access all of your medical information from anywhere.

CS410 Spring 2019
Red Team
April 24th, 2019
Amber Martinez * Alex Kostyn * Alex Baker * Steven Vardaro * Josh Smith * Daniel Kent
# Table of Contents

- Team Biographies ................................................................. 3
- Problem Statement .............................................................. 4
- Customer .............................................................................. 5
- Problem Characteristics ...................................................... 6
- Problem Statistics ............................................................... 7
- Process Flow ......................................................................... 8-10
- Major Functional Component Diagram ............................ 11
- Goals & Objectives ............................................................... 12
- Solution Characteristics ...................................................... 13
- Application Features ........................................................... 14
- Competition ......................................................................... 15
- Will and Will Nots ............................................................... 16
- Development Tools .............................................................. 17
- Development Model ............................................................. 18
- Work Breakdown Structure .............................................. 19-21
- Algorithms .......................................................................... 22-24
- Technical Approach – Encryption ..................................... 25
- Algorithms .......................................................................... 25-26
- Work Breakdown Structure Cont ..................................... 26-30
- Database Schema ............................................................... 31
- Work Breakdown Structure Cont ..................................... 31-32
- Risks .................................................................................. 32
- GUI Mockups & Rapid Prototype ...................................... 33
- Conclusion ........................................................................... 33
- References ........................................................................... 35
- Appendix ............................................................................. 47
- User Stories ........................................................................... 48
- Work Breakdown Structure Cont ..................................... 49-50
- Appendix ............................................................................. 51
- User Stories ........................................................................... 52-55
Our Team

Amber Martinez  
Project Lead

Alex Kostyn  
Cloud Security Engineer

Alex Baker  
Solutions Architect

Steven Vardaro  
Algorithms Developer

Daniel Kent  
UI/UX Developer

Josh Smith  
Database Engineer
Problem Statement

Healthcare patients do not have a central mobile environment to promptly access, organize, and share their medical information with various providers.
The Customer

Our target customer for this application is anyone that uses a mobile smartphone and needs to access all of their medical records from one place. The Patient Advocate application would greatly benefit those in need of medical care outside the scope of their primary care provider’s network, those with chronic conditions, and those who take care of dependents and the elderly.
Problem Characteristics

- Patients’ records are scattered throughout different electronic health record (EHR) systems, impacting record completeness.
- Patients do not have a way to update their daily regimen for their physicians, impacting emergency care.
- Patients do not have a way to access medical records outside of their provider office, impacting patient convenience.
Problem Statistics

- Roughly three million adults over the age of 65 and 1.5 million children under the age of 18 visited physicians’ offices in 2015. [14]
- 6.7% of noninstitutionalized adults over the age of 65 reported needing help with personal care in 2017. [15]
- "In March 2017, 67% of all providers reported using an EHR."[11]
- "67% of providers reported not liking the functionality of their EHR systems."[11]
- "Currently, there are roughly 1100 vendors that offer an EHR."[10]
- "Only 40% of hospitals and 14% of doctors share data outside their organization."[12]
Major Functional Component Diagram
Goals & Objectives

- Provide an easy-to-use mobile application for the user.
- Allow the user to pull all of their medical information into one application.
- Aid healthcare providers in obtaining patient’s healthcare records.
- Ensure that all patient data is secure.
- Accelerate prerequisites needed for diagnosis.
- Digitize patients’ non-electronic records.
Solution Characteristics

- Log into existing patient portals and gather available medical record information, improving record completeness.
- Allow access to self and dependent records, enhancing patient convenience.
- Detail patient daily regimen to share with providers, enhancing emergency responsiveness.
Application Features

- Calendar containing appointments and notifications
- Patient log/notes section
- Data encryption
- Comprehensive medication information
## Competition

<table>
<thead>
<tr>
<th></th>
<th>Patient Advocate</th>
<th>Seqster</th>
<th>Picnic Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Records</td>
<td>×</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient Incidentals</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Medical Data</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Integrated Data</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Auto Update</td>
<td>×</td>
<td>×</td>
<td></td>
</tr>
<tr>
<td>Communication w/ Provider</td>
<td>×</td>
<td></td>
<td>×</td>
</tr>
<tr>
<td>Medication Data Advocate</td>
<td>×</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## What Our App Will and Will Not Do

<table>
<thead>
<tr>
<th>Our app will...</th>
<th>Our app will not...</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Allow end users to log into their existing patient portals.</td>
<td>● Allow patients to change physician provided medical records.</td>
</tr>
<tr>
<td>● Allow access to dependent records</td>
<td>● Allow unauthorized access to patient records.</td>
</tr>
<tr>
<td>● Gather available record information from existing patient portals.</td>
<td>● Modify providers’ existing EHR systems.</td>
</tr>
<tr>
<td>● Allow users to specify their daily regimen to share with providers.</td>
<td></td>
</tr>
<tr>
<td>● Observe HIPAA laws.</td>
<td></td>
</tr>
</tbody>
</table>
Development Tools

Software Requirements

- Code Repository: GitHub
- Continuous Integration: CircleCI
- Containerization: Docker
- App: Java, C++, and Swift
- API: Python + Flask
- Machine Learning: Tensorflow, Tesseract, and NLTK
- Database: MySQL
- Database Cache: Redis

Hardware Requirements

- Server: single compute instance
- Client: smartphones for testing:
  - iPhone
  - Android
Development Model - Agile
Work Breakdown Structure

GUI

Algorithms

Database

External Interface

Testing
Work Breakdown Structure - Algorithms

- Machine Learning
  - Image Recognition
  - Trends
- Security
  - Encryption
  - Account Setup
  - Communication
- Communication
  - REST API
  - HTTPD
- Searching
  - Lucene
  - Knuth-Morris-Pratt
  - Rabin-Karp
- Website Scraping
  - Beautiful Soup
  - Selenium
  - Requests
Algorithms - Machine Learning: Image Recognition

Key Terms

**Tensorflow**
- Deep learning powered by Google for Python

**NLTK**
- Natural language processing library

**PyTesseract**
- Optical character recognition for Python
Algorithms - Machine Learning: Trends

- Locker is accessed
  - Checking MetaData
    - Is there enough data?
      - Yes
        - Is deep learning available?
          - Yes
            - Tensorflow kernel used.
          - No
            - Information found is displayed.
        - No
          - Display most recently imported information.
    - No
Encrypted data is stored in a locker.

A Locker is:
- A folder that contains:
  - Database
  - Profile
  - Medical Records
  - Patient personal logs
  - Images
  - Release of Information waiver
- Locker is split into chunks

MetaData is:
- List of chunks
  - MD5 Sum per chunk
  - Last modified
- Date Uploaded
- Total Size

Algorithms - Security: Encryption

Secure Transmission
Technical Approach - Encryption

● All of the data is stored in a safe.
● This safe is encrypted with your password.
● You use this password like a key to un-encrypt the safe on your APP or Desktop Application.
● When you add to this safe, it encrypts it and then sends it up to our servers.
● There we make sure that your safe is always accessible via the internet.
● No one, not even the administrators, will be able to access your safe.
Algorithms - Security: Update

Client Side

- User has updated profile
- User receives update reminder

Server Side

- Update reminder created for future date
- App checks last update date daily
- Profile updated?
- Update reminder notification sent via app and email

Yes

No
Algorithms - Security: Account Setup

Client Side
- User downloads Patient Advocate app
- User completes account setup form
- Local Locker created
- User completes verification
- User notified account exists
- Account creation request sent to server

Server Side
- Request Aborted
- Request received for processing
- Email verification sent to user
- User Locker created
- Account already exists?
- User account stored
- Request Completed
- PatientAdvocate * Red Team * 4/24/2019 * Page 27
Algorithms - Communication

PatientAdvocate attempts connection with patient portal

Manual HTTPD navigation

No

Is API available?

Yes

REST API

Link is established
Key Terms

Lucene
- Full-text search library
Algorithms - Website Scraping

Key Terms

- **Beautiful Soup**
  - Python data extraction library for HTML and XML.

- **Selenium**
  - Web browser automation tools for grabbing HTTP data without an API.

- **Requests**
  - Python library for sending HTTP requests using an API.
Work Breakdown Structure - Database

Database

Externally Managed Databases
- Provider Information
- Electronic Record Systems

PA Managed Databases
- User Accounts
- Locker
  - Patient Profile
  - Medical Records
  - Waivers

Medical Data
- Medication Data
- Imaging Data
- Family History
- Patient Data / Demographics
- ...
Database Schema - PA Managed Databases

[Database diagram showing relationships between Patient, PatientHistory, Allergy, Medication, Encounter, Note, Observation, Image, and Document tables with various fields and relationships depicted.]
Work Breakdown Structure - External Interface

External Interface

- EHRs
- AWS
- User Input
Work Breakdown Structure - Testing

- Testing
  - Unit Tests
  - Integration Tests
  - System Tests
  - Penetration Tests
### Risk Matrix

**Legend**

<table>
<thead>
<tr>
<th>T - Technical Risk</th>
<th>C - Customer Risk</th>
<th>S - Security Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 - Meet all HIPAA security requirements.</td>
<td>S2 - Application or cloud breach.</td>
<td>S3 - User loses their password.</td>
</tr>
<tr>
<td>T1 - Dependant on record formats that we receive.</td>
<td>T2 - Patient unable to access the internet.</td>
<td>T3 - We have difficulties establishing a link with various patient portals.</td>
</tr>
<tr>
<td>T4 - Data loss within the network.</td>
<td>T5 - Local data version conflict with server version.</td>
<td></td>
</tr>
<tr>
<td>C1 - Patients input incorrect data into their profile.</td>
<td>C2 - Patient’s medical record completeness is self-dependent.</td>
<td>C3 - Patient has difficulties establishing multiple dependent profiles.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2, S1</td>
</tr>
<tr>
<td>High (4)</td>
<td>S3, T4, C2, T1</td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2, T3, C3, C1</td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td>T5</td>
</tr>
</tbody>
</table>

---

*PatientAdvocate * Red Team * 4/24/2019 * Page 35*
## Security Risk - S1

### Risk
Meet all HIPAA security requirements.

### Risk Mitigation
Communication between the client and server are encrypted using HIPPA approved methods.

### Legend
- T - Technical Risk
- C - Customer Risk
- S - Security Risk

<table>
<thead>
<tr>
<th>Severity (x)</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>S2</td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>S3</td>
<td>T4,C2</td>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>T2,T3,C3</td>
<td>C1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
</tr>
</tbody>
</table>

**Probability**
Security Risk - S2

### Risk
Application or cloud breach.

### Risk Mitigation
Encryption and Decryption are done on the device only. This protects users in the event of a system compromise.

---

**Legend**

T - Technical Risk     C - Customer Risk     S - Security Risk
Security Risk - S3

Risk
User loses their password.

Risk Mitigation
Introduce account recovery codes at the creation of the account which can be used to recover information stored in the account. Additionally a validation process is put in place to recover account passwords. For instance, recovery codes or secret passphrases.

Legend
T - Technical Risk     C - Customer Risk     S - Security Risk
## Technical Risk - T1

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (4)</td>
<td>S3</td>
<td>T4,C2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2,T3,C3</td>
<td></td>
<td>C1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
</tr>
</tbody>
</table>

### Risk
Dependant on record formats that we receive.

### Risk Mitigation
Transcribe records to a format that is acceptable.

### Legend
- **T** - Technical Risk
- **C** - Customer Risk
- **S** - Security Risk
Technical Risk - T2

**Risk**
Patient unable to access the internet.

**Risk Mitigation**
An encrypted local copy of the record will be kept on the local device for a limited time.

**Legend**

- T - Technical Risk
- C - Customer Risk
- S - Security Risk

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
</tr>
<tr>
<td>High (4)</td>
<td>S3</td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2,T3,C3</td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
</tr>
</tbody>
</table>
Technical Risk - T3

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
</tr>
<tr>
<td>High (4)</td>
<td>S1</td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T4,C2</td>
</tr>
<tr>
<td>Low (2)</td>
<td>T1</td>
</tr>
<tr>
<td>Very Low (1)</td>
<td>C1</td>
</tr>
</tbody>
</table>

Risk
We have difficulties establishing a link with various patient portals.

Risk Mitigation
Work with patient portal administrators to remedy link issues.

Legend
T - Technical Risk   C - Customer Risk   S - Security Risk
## Technical Risk - T4

### Probability

<table>
<thead>
<tr>
<th>Severity</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (4)</td>
<td>S3</td>
<td>T4,C2</td>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2,T3,C3</td>
<td>C1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
<td></td>
<td>T5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Legend

- **T** - Technical Risk
- **C** - Customer Risk
- **S** - Security Risk

**Risk**

Data loss within the network.

**Risk Mitigation**

Data is replicated in the data center, and disaster recovery plans created.
## Technical Risk - T5

### Legend

- **T** - Technical Risk
- **C** - Customer Risk
- **S** - Security Risk

### Probability

<table>
<thead>
<tr>
<th>Severity</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>S2</td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>S3</td>
<td>T4,C2</td>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td>T2,T3,C3</td>
<td>C1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
</tr>
</tbody>
</table>

### Risk

Local data version conflict with server version.

### Risk Mitigation

Prompt user to either save changes or force upload.
Customer Risk - C1

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
<td></td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (4)</td>
<td></td>
<td>S3</td>
<td>T4,C2</td>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium (3)</td>
<td></td>
<td></td>
<td>T2,T3,C3</td>
<td>C1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Risk**
Patients input incorrect data into their profile.

**Risk Mitigation**
Allow patients to edit profile settings and implement a type of “auto-complete” feature.

Legend
Customer Risk - C2

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
<th>Risk Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low  (1)</td>
<td>Very High (5)</td>
<td>S2</td>
</tr>
<tr>
<td>Low (2)</td>
<td>S1</td>
<td>Encourage portal linkage.</td>
</tr>
<tr>
<td>Medium (3)</td>
<td>High (4)</td>
<td>T4,C2</td>
</tr>
<tr>
<td>High (4)</td>
<td>T1</td>
<td></td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2,T3,C3</td>
<td>C1</td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
<td>T5</td>
</tr>
</tbody>
</table>

Legend

## Customer Risk - C3

### Legend

<table>
<thead>
<tr>
<th>T - Technical Risk</th>
<th>C - Customer Risk</th>
<th>S - Security Risk</th>
</tr>
</thead>
</table>

### Risk

Patient has difficulties establishing multiple dependent profiles.

### Risk Mitigation

Provide a walkthrough that details how to set up additional profiles within the Patient Advocate app.

### Probability Table

<table>
<thead>
<tr>
<th>Severity</th>
<th>Very Low (1)</th>
<th>Low (2)</th>
<th>Medium (3)</th>
<th>High (4)</th>
<th>Very High (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>S2</td>
<td>S1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (4)</td>
<td>S3</td>
<td>T4,C2</td>
<td>T1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium (3)</td>
<td>T2,T3,C3</td>
<td>C1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Low (1)</td>
<td></td>
<td></td>
<td></td>
<td>T5</td>
<td></td>
</tr>
</tbody>
</table>
GUI Mockups & Rapid Prototype

Home Screen

Contact a Provider Screen

https://xd.adobe.com/view/8c647f77-31f7-42ed-75ff-52388727ee1c-fa55/?fullscreen
Conclusion

The Patient Advocate application seeks to enhance the ability of patients to use the healthcare industry by expediting the gathering and sharing of patient healthcare data.
References

1. Apple lets veterans track their health records on the iPhone

2. What is an electronic health record (EHR)?
   https://www.healthit.gov/faq/what-electronic-health-record-ehr

3. PRIVACY, SECURITY, AND ELECTRONIC HEALTH RECORDS

4. MyChart
   https://www.novantmychart.org/mychart/default.asp?mode=stdfile&option=faq

5. FollowMyHealth
   http://support.followmyhealth.com/customer/portal/articles/1523612-what-is-a-universal-health-record-

6. PicnicHealth
   https://picnichealth.com

7. Seqster
   https://seqster.com

8. Evidence of Cost Benefits of Electronic Medical Records
   https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5596299/

9. Benefits of switching to an electronic health record
   https://www.practicefusion.com/health-informatics-practical-guide-page-1/

10. Why Are There So Many EHR Systems?
    http://cliniciantoday.com/why-are-there-so-many-ehr-systems-analyzing-a-bloated-market/

11. EHR adoption rates: 20 must-see stats
    https://www.practicefusion.com/blog/ehr-adoption-rates/

12. Making electronic health records talk to each other

13. Title Slide Background Image
    https://i.ytimg.com/vi/AeljIRwSF3A/maxresdefault.jpg
References

14. Visits to physician offices, hospital outpatient departments, and hospital emergency departments, by age, sex, and race: United States, selected years 2000–2015
   https://www.cdc.gov/nchs/data/hus/hus17/076.pdf

15. Percentage of older people who needed help with personal care from other persons in the U.S. from 1997 to 2017

16. Agile Image
   https://cdn-images-1.medium.com/max/1600/1*6ExaSoRT9JOUyadF47eqQ.jpeg
Appendix
User Stories - Administrator

I need to be able to:
1. Make changes to the application’s user interface.
2. Create user accounts.
3. Modify user accounts.
4. Remove user accounts.
5. Have any requests traceable to PatientAdvocate.
7. Provide robust data backups.
8. Facilitate communication with major EHR systems through custom interface designs.

I wish to be able to:
1. Receive user feedback to resolve issues.

I must not be able to:
1. View encrypted patient records to ensure patient privacy.
### User Stories - Patient/Legal Guardian

**I need to be able to:**

1. Download the PatientAdvocate application.
2. Create a user profile.
3. Log into my account.
4. Log into each of my health care providers’ websites to link them to the application.
5. Access dependant health care records.
6. Manually import my medical data.
7. Share my medical record via email.
8. Share my medical record in PDF format.
9. Take pictures of non-digital records for importation into the application.
10. Take notes of my daily activities.
11. Take notes of reactions to medications.
12. Search the application for certain medical criteria.

**I wish to be able to:**

1. Receive notifications from my health care providers.
2. Contact health care providers through the application via email or phone.
3. View health care appointments in the application.
4. View information about medications and how they interact with each other.
5. Link my other health applications like Fitbit, Garmin, Ancestry.com, etc.

**I must not be able to:**

1. Modify existing medical record information obtained through linking to the patient portal.
2. Access patient portal information without having signed a release of information.
User Stories - Health Care Provider

I need to be able to:

1. View the exported medical records from the application.

I wish to be able to:

1. View patient information in PDF format.

I must not be able to:

1. View any impertinent patient information without expressed consent of the patient/legal guardian.
User Stories - Guest/Visitor

I need to be able to:
1. View the website.
2. View mockups.
3. Request an account.

I wish to be able to:
1. Link to the app store from the website.
2. Download the app from a desktop computer or smartphone.
3. Attempt to log in to the app.

I must not be able to:
1. Access any internal features of the app without having an account.