core

Jesse Palma
Senior Thesis: The Future of
Patient Health Records

Why did I choose to focus on the topic of health records?

Growing up, my dad had **type 2 diabetes and chronic kidney disease.** He always struggled with managing his health conditions and was always frustrated when it came to his records, especially when it came to moving from doctor to doctor. Eventually, his kidneys began to fail and he had to go on dialysis which made managing his health a lot more difficult.

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Points of Research in PHRs

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Health Management
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Product Design

UI/UX and Industrial Design

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Ideation Sketches (Affinity Mapping)
Refined Concepts and Evaluation

Web and Phone Application
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Wireframing (Photos, Iterations, Feedback from Users)

Core
Final Design with Details
Renders of Product and Interface
Style Guide/Branding Elements

Problem Statement

Patients need a way to **systematically access and manage their health record** seamlessly across unaligned legacy systems because the current system disrupts the management of one's health.

In healthcare, information access should be consistent and portable while keeping the patient at the center of the interoperability system.
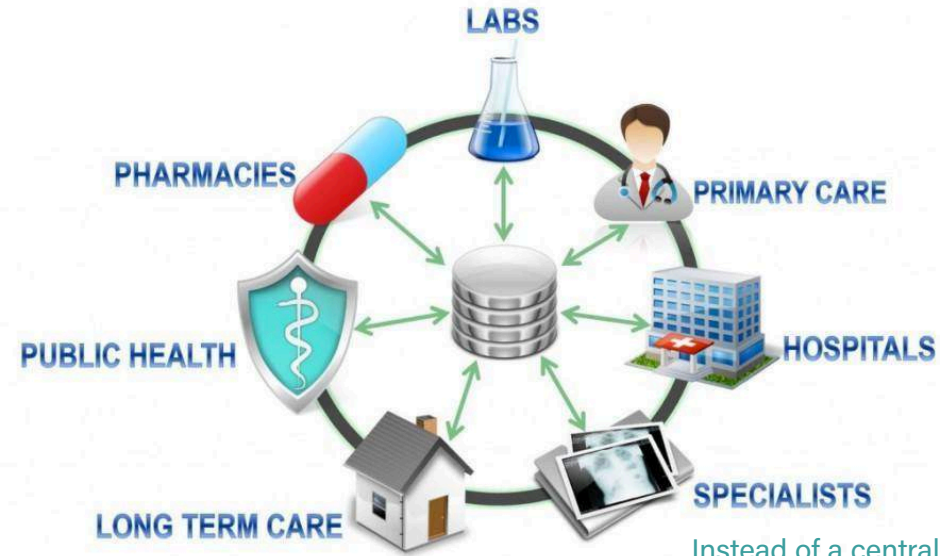
Instead of a central data location, patients should be at the center of the healthcare interoperability system.

What

What is the problem?

Using National Cancer Institute survey data, a study found that 52 percent of US citizens were offered access to an online medical record by a healthcare provider or insurer in 2017. Of those who were offered access, 53 percent viewed their records only once in the past year.

The process of accessing and managing your health record is a daunting process. Current practices are not up to date and lack systematic integration and patient ownership.

When/Where

When and Where does this occur?

The problem can occur when you're at your healthcare provider or at home when you're managing your health through your patient portal or paper formatted records.

There are many instances where these stakeholders are involved: medical practitioners, primary care, hospitals, emergency rooms, pharmacies, labs, rehabilitation centers, nursing homes, billing providers, insurance companies, etc.

Who

Who is affected?

All adults are affected by this problem. For example, a 19-year old young adult who needs to transfer their health record from their pediatrician to their internal medicine doctor or a 55-year old adult who is managing multiple diseases and being cared for by multiple doctors in multiple places.

Although, people managing a health condition are affected by this the most because of the necessary actions that need to be carried out to take care of themselves.

Why

Why does it matter?

To improve patient-provider engagement and to help you understand, advocate for, and manage your own healthcare.

In addition, to ensure that the right people have what they need to safely care for you: family members and caregivers, doctors, specialists, other providers, and emergency care teams.

Current State

Most individuals are **simply unaware or did not believe** they had the right to an electronic copy of their medical record. In many cases, patients are prevented from obtaining their records because more often than not, healthcare workers don't understand patient rights themselves.

73 Percent

73 percent of US patients don't know they have a HIPAA-protected right to have a copy of any kind of their medical records.

41 Percent

41 percent of US patients say they have never even seen their own health information.

8 in 10 People

8 in 10 people who view their medical records consider that information beneficial and feel like they have more control over their health journey and decisions.

78 Percent

According to the GetMyHealthData initiative, 78 percent of people who get copies of their health records have better communication with their doctors.

Requests are frequently denied for the following/invalid reasons:
1. HIPPA prevents healthcare providers from releasing their records.
2. Electronic copies are only available or paper copies are only available.
3. Caregivers or family members aren't able to request them.
4. The request has to be made in person.
5. If you have an unpaid hospital bill, you're unable to attain your records.
6. The fee is too high.

Patients cannot be refused access to their health information. They may be charged a "reasonable fee," but healthcare providers aren't legally allowed to withheld their record if they are unable to pay it or if they have an unpaid healthcare bill. Patients are also able to designate who has permission to access their records, along with requesting information on who has access to their records.

Initial User Interviews

The key takeaway from my initial user interviews was that they were (or someone was) unsure of whether or not they had the ability to access their health record (whether it was online or in-person) because of the **lack of relayed information from the provider to the patient.**

Nick Barba, Age 21

"I don't think I have access to my health record. I don't really know how or if I have a patient portal. If I do, it's poorly communicated to me by my doctor. I think he has all the information from my old doctor."

Evelyn Palma, Age 46

"I think St. Bernard just started doing online medical records but I've never tried accessing it. I don't know if our records are online. I usually just sort everything (paper records) in folders anyways since I have to keep track of everyone's."

Jessica Wong, Age 24

"There was a poorly trained receptionist who didn't understand what I was asking for, even after I explained to him that I needed my records and that I have a new doctor for internal medicine since I can't see a pediatrician anymore. He had to ask a nurse for assistance and it made the process annoying."

Methodology: Literature Review + User Interviews
Source: American Health Information Management Association

Stages	Request	Forms			Completion		Retrieval	
Sub Stages	Search	Credentials	Directions	Release	Submit	Gathering	Preparation	Channels
Goals	To learn how to request records and what information is needed.	To gather required information necessary to move forward with requesting your record.	To initiate the request process and to properly understand how to fill out the release forms.	To successfully input valid information into the required fields.	To send an official request to the healthcare provider.	To wait for the healthcare provider to gather the information requested.	To accurately prepare what you requested.	To give one's record through a specific channel in a timely manner.

Touch Point Map

At-Home

Patient calls the hospital, checks patient portal or looks online.

Patient looks up PIN, MRN, SSN, etc.

Patient clicks through patient portal to click the "request records" or "download or send your records" button.

Patient inputs credentials and answers questions like "Why is this information needed?"

Patient clicks on the "submit" or "send" button. *Is feedback given that the hospital received it?

Patient waits for confirmation about receiving the request or pays a fee.

Patient goes about their daily life OR if they are at the doctor's office, they have to wait (30 minutes - 1 hour).

Success! Patient receives the record through patient portal, EHR, personal email, CD, thumb drive, fax, mail, or paper.

Add 30+ minutes if copies of scans are requested.

Doctor's Office

[Phone Call] Office tells patient how to request it and what is needed.

Patient goes up to the reception desk to give credentials, receptionist explains forms and hands them over to the patient.

Patient sits down in the waiting room to fill out the paperwork on a clipboard.

Patient finishes and hands over completed forms to receptionist. Patient ask questions such as "When will I receive my records?"

Doctor's office is searching for the information: paper records, EMRs, EHRs

Office prepares the record and it may take up to 30 days.

● Moments of delight

Satisfaction Levels

Satisfied

At-Home

Doctor's Office

Unsatisfied

● Home
● Doctor's Office

Opportunities

Educating about health records during doctor visits.

Storing information in one place.

Creating a clear "call to action."

Informing how much time should be set aside.

Auto-fill or progress bars.

Gives feedback to the user on what to expect next.

Using AI technology to easily convert paper records into electronic records.

Incorporating status updates similar to how you can track a food delivery.

Creating a brand or packaging that promotes health management.

Most users are unaware of requesting their records through an online portal or their healthcare provider doesn't offer an option to request a record online which pushes customers to disrupt their day-to-day to come to the doctor's office.

Experience Map

Key Takeaway #1
There's a lack of education and awareness (given by the healthcare provider) about **the benefits of how a patient can use health records to their advantage.**

Key Takeaway #2
Patients tend to spend a good amount of time preparing for the request before they arrive at the hospital.

Key Takeaway #3
Most users are unaware of the ability to request their records through an online portal or their healthcare provider doesn't offer an option to request a record online which pushes customers to **disrupt their day-to-day** to come to the doctor's office.

Medical practitioners are the most knowledgeable about a patient's EHR, EMR, or PHR. If there is more transparency about a patient's record between them and their doctors, it will increase patient engagement.
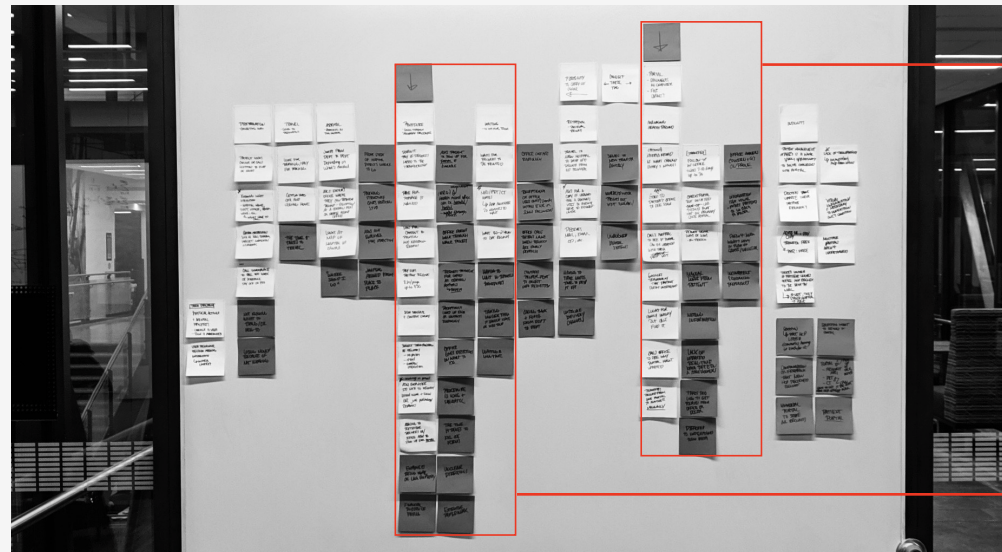
Current Route

Medical Practitioners	→	Reception/Health Record Office	→	Patients

Primary Stakeholder

Medical Practitioners (Surgeons, Specialists, Internal Medicine, etc.
Radiology (Scans)
Billing Providers
Insurance Companies
Labs (Test Results)

Secondary Stakeholder

Nurses
Care Staff
Reception
Health Record Office
Hospital Website/Portal
Pharmacies
Emergency Care Teams

User

Children and Parents
College Students/Young Adults
Patients Managing Multiple
Diseases at Multiple Locations
Caregivers/Older Adults
Patients w/Chronic Conditions

Stakeholder Interaction

When patients are trying to request, access, transfer, and understand their record, their first resource is to contact or discuss their concerns with a receptionist or health record office, and occasionally, their doctor. A receptionist and the health record office aren't as empathetic towards a patient's needs because they do have direct interaction with a patient's care compared to medical practitioners.

Receive and Review
In this opportunity space, there's room to expand the personal health record space by adding additional actions outside of only "viewing" your record. Everything before this step can also occur online.

Transfer Process and Waiting
The transfer process has the most interaction between a patient and a stakeholder. The time and effort it takes to carry out transfer tasks can be minimized by incorporating a system that cuts down waiting time.

User Task Analysis

A user task analysis was carried out to understand how often (current process) they are interacting with a primary stakeholder and to uncover insights where direct access and communication could occur between a doctor and a patient.

EHRs, EMRs, and PHRs

[Network] EHRs include data from ALL clinicians and facilities involved in a patient's record. They have access to diagnosis, clinical notes, treatments (including treatments from other providers), allergies, lab reports, and prescriptions.

An EHR "provides little sense of how one event led to the next, how one symptom relates to another, the emotional context in which the symptoms or events occurred," she said. "It's not well-suited to communicating a patient's complex experience or a physician's interpretation of that experience as it evolves over time."

[Provider] EMRs are digital or paper versions of a patient's chart (i.e. pdf of raw data). They are mostly used by only a SINGLE provider. EMRs include diagnosis, clinical notes, and treatments from one provider.

[Patient] PHRs are an electronic application or analog method through which patients can maintain and manage their health information (and that of others for whom they are authorized) in a private, secure, and confidential environment. Patients have to manually transfer information from each of their PHRs to other PHRs to keep them updated if they have more than one healthcare provider in different networks. PHRs aren't limited to a patient portal, they can be managed through a home computer in folders, a third party reputable website or a file folder of paper printed records.

There's an **opportunity gap** from when information from EHRs are transferred into PHRs. Most of the time, clinician notes during doctor's visits and notes between your healthcare team are often withheld. Being able to **visualize the collaboration between your doctors and the patient** will allow for an easier transition when it's time to switch providers or telling a new provider about their condition.

Source: https://www.nextavenue.org/electronic-health-record-not-enough-information/

PHR
- Managed by patients themselves
- Complete summary of health history

EHR
- Broad view of patient's health information
- Shared among multiple providers and hospitals

EMR
- Created and managed by a single healthcare provider
- Aren't good for sharing
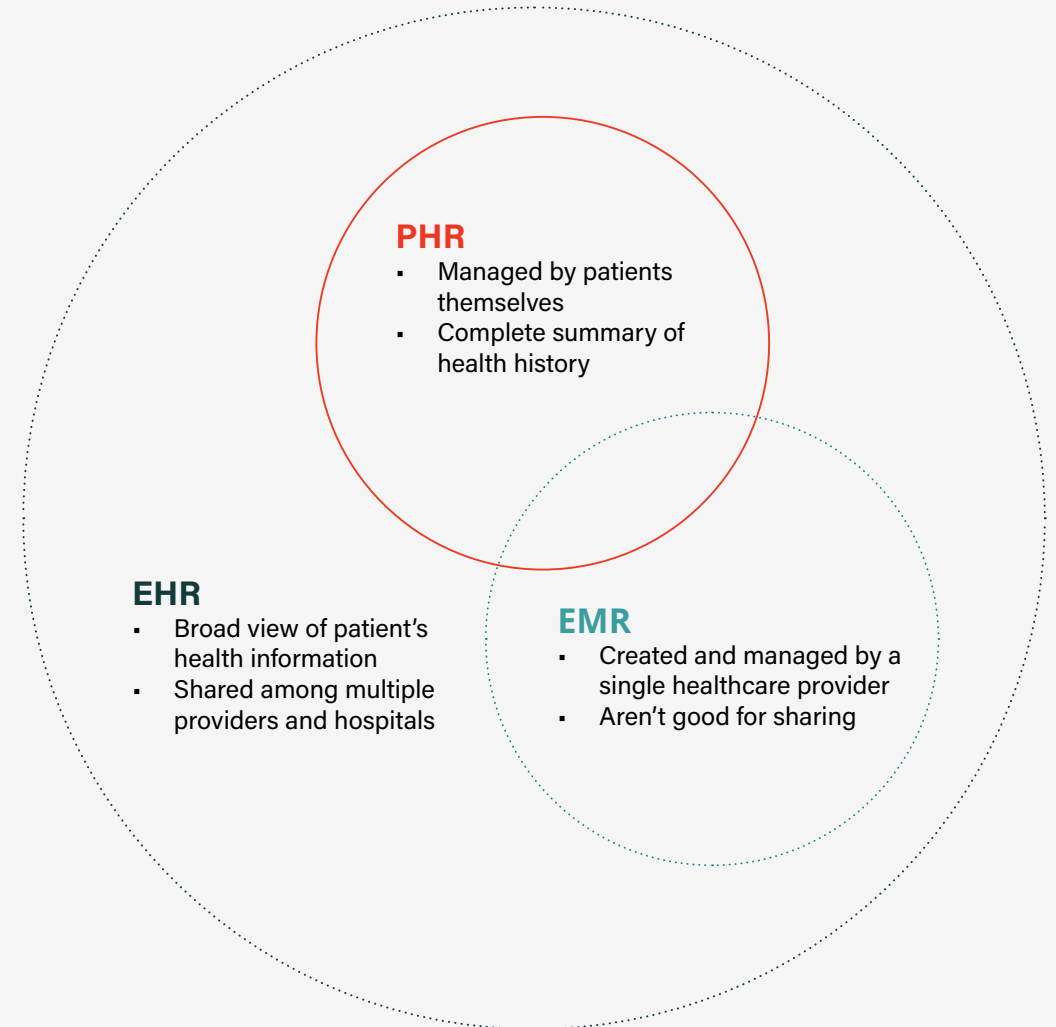
Market Positioning of the Top 10 PHRs

With *Allscripts FollowMyHealth*, *Epic's MyChart*, and *eClinicalWorks* being the top patient portals with access to patient education resources and preventive health goals and tracking, there is still opportunity for customization and resourcefulness **to create a focal point for a patient's narrative.**

What keeps users coming back to login into their patient portal? Information and benefits that are customized to each patient's needs.

Sweden Healthcare System
Sweden is giving access to all citizens access to their electronic health records. Two things enable this; a national patient portal and a national health information exchange platform. Although the county councils are autonomous and can prioritize which eHealth services to focus on, the decision was made at a national level that patients should only have one way to reach healthcare. A national patient portal, '1177.se' is available for anyone seeking healthcare or health-related information in Sweden.

Apple Health Records
FHIR (Fast Healthcare Interoperability Resources)
Apple Health Records is able to connect EHRs into one confined location to make it easier to access. The Health app will periodically connect to your EHR APIs to pull in any new health records and notify the user when new records are available.

Methodology: Market Positioning
Source: https://www.ehrinpractice.com/best-ehr-patient-portals-comparison.html
https://patientengagementhit.com/news/top-hospital-patient-portal-vendors-by-implementations

OPPORTUNITY SPACE

Resourceful

FollowMyHealth
MyChart
eClinicalWorks
Improving Healthcare Together

INTELICHART
Engagement to Outcomes

athenahealth
MEDITECH
MEDHOST
Cerner
cpsi
RelayHealth

Customization

Standard

*Most patient portals offer enough resources they would need, but not enough to keep patients coming back to it.

Inefficient

Contextual Inquiry on Usability

Piper Stamper, Age 21
MyChart, No Health Conditions

"I only really use the scheduling feature on the app but it doesn't work sometimes. It takes awhile to get a response from the office to see whether my request appointment time was approved. So I just end up calling them instead. Besides that, I don't use it often."
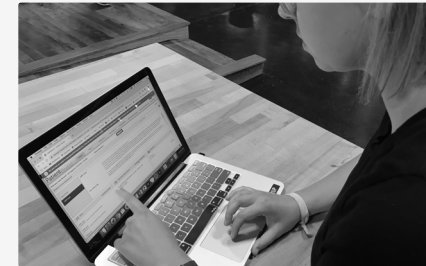
Anna Kiemel, Age 21
NextMD, Medical Chart
Severe Allergy Condition

"I'm not a fan of the dashboard on this portal. There's too many boxes and it feels like information overload when I'm trying to find a specific thing. I also have a hard time understanding the medical terminology when I'm looking at my chart."

Claudia Guevara, Age 26
7 Patient Portals
Thyroid Carcinoma Stage 3

"Every time I transfer my records, I should be able to see them in both portals (old and new) but most of the time, this does not happen and my doctor's office will know the general gist of your situation and may not have everything they need. This is why its best for the patient to have all their records."

Key Insights
1. Patient portal interfaces are too confusing because of the lack of visual hierarchy and easy access to pertinent information they care about.

2. Patients are frustrated when staff doesn't respond to them in a timely manner which causes patients to lose dependability on the portal and their providers.

Overall Usability: 76%

Medstar Health
"I think the only challenge I have with this portal is that it does not have any of my records before 2018. It's a fairly new system and I am not sure if its because it needs to be manually entered or if its because the doctors use note in order to keep up with a health issue. Also the messaging system, doctors never respond through the portal. It's easier to email or call."

Overall Usability: 10%

Medstar Billing
"Billing in every hospital is a pain. The problem with this, is that I have to access each individual invoice/ visit. There is no way to know an overall amount that I owe the hospital and each invoice has to be paid individually."
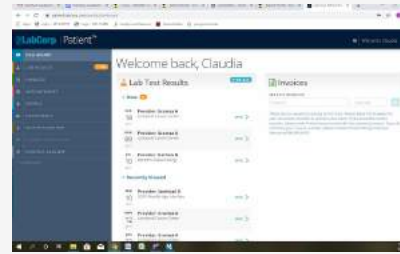
Overall Usability: 31%

LabCorp
"This one does not have all of my records, even though they are the lab that does my blood analysis. They have not added any other tests that have been run either. I think every time they have results, they should add it to my LabCorp portal and send to the doctor that ordered the blood work."
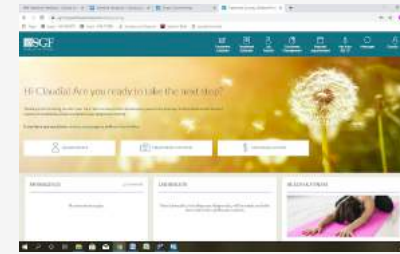
Overall Usability: 49%

Shady Grove Fertility
"My results are sent in a message to me and not added to the portal. I do not think the office keeps up with the records. I do not know if they need to upload my test results or if they can just give me access to them, but for some reason that doesn't work. Although, I do like how the front page is laid out."
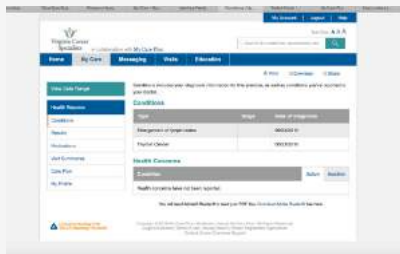
Overall Usability: 81%

Virginia Cancer Specialist - Home Page
"I honestly have not used this portal a lot. I like that it has an **education tab.** A lot of the time when you have a health issue, how to get your body back to a "normal" state is important. It shouldn't be hard and its nice that this portal has a little cheat sheet."
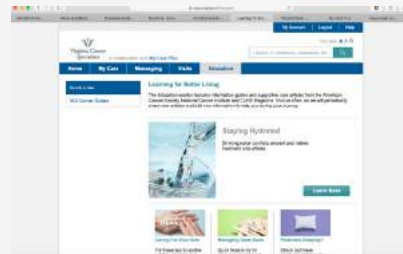
Overall Usability: 84%

Virginia Cancer Specialist - Education
"I think it's a good start, but I think it can have more information. **Add mental health, nutrition, a cookbook, list different organizations that can help based on diagnosis.** Hospitals can partner with different organizations to get this information too. **I like the fact that they have this, a lot of portals do not.**"
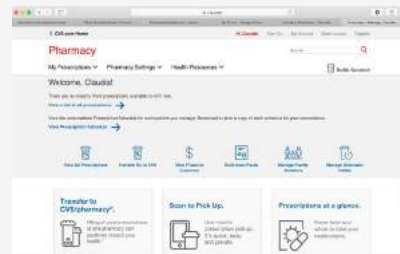
Overall Usability: 96%

CVS Pharmacy
"I think for me it's difficult because my name changed so I do not have all my prescriptions online. I think a wellness tab would be good here. Also, they could make money off of that. I think this portal is more about prescriptions and pick up. It's pretty much good."
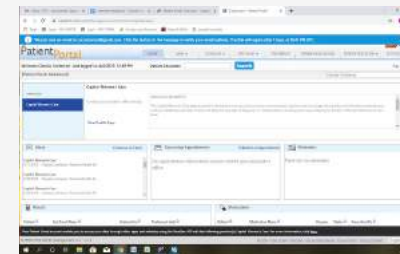
Overall Usability: 14%

Capital Women's Care
"I do not like the structure of this portal. There are too many things going on. I think you don't need all the boxes that this portal has. I understand that it might be easier to see all in one screen, but it gets too confusing. I do like that in this portal you can see your invoices."

In-Dept Contextual Inquiry

Claudia Guevara, Age 26
7 Patient Portals
Thyroid Carcinoma Stage 3

Layout
Layout of pertinent information is a key component for the patient to easily find necessary information they are looking for.

Disconnect
There is a disconnect between different portals/ hospitals where information isn't synced which makes it difficult to keep track of where is what and if a record was successfully transferred.

Education
The education tab was a feature that Claudia appreciated the most out of all of her portals, it made her feel that there's more to her life than having cancer.

More User Interviews

The purpose of these user interviews were to understand how health records and the patient portal play a role with someone who has a chronic condition.

" "My daughter takes care of my records for me. She comes with me to all of my appointments so I don't have to do it. **I think she does everything online**, I'm not entirely sure how she does it."

Jose Valerio, Age 67
Colon Cancer Stage 3

" "I'm always having to wait for long periods of time if I'm requesting a **paper copy** of my dad's record. Most of the time, I'm having to **take a day off from work** in order to do so."

Evelyn Palma (Jose Valerio's Daughter), Age 46

" "Its easier for me to stick to one network because all of the doctor's know each other. **If I go to a different doctor, out of my network, it makes it difficult for me to attain my health records so I try to avoid that.** I like the portal because everything is in one place but it makes it hard sometimes when they update their system."

"I feel like doctors withhold information from me sometimes. **I think doctors need to inform patients about everything that's happening and all the possibilities that could occur, whether it's good or bad.**"

Laura Drake, Age 54
Breast Cancer, Remission

" "First Because of my age, **no one thinks your going to get cancer at 23.** Second, I was recently diagnosed, but the cancer had been growing since I was a teenager. The doctors wanted to make sure of what they were doing. I think because it was thyroid cancer, they thought it would be easy. Every doctor that I saw, kept saying this was temporary, and common, to not worry. Little did they know, I was the worst case scenario. Honestly, I didn't really know what I was going through until about a year later."

"I think when a patient is diagnosed with a serious condition, the doctors think how can we cure this. And they go on and create a game plan, which is great. **But they also have to think of what kind of life the patient wants to live. I think that gets lost, and it shouldn't.**"

"It was difficult not knowing what my path looked like. **Doctors kept telling me that I had thyroid cancer and it's the good cancer to have.** I was just gonna have surgery and radioactive iodine (RAI), then I'd be okay. Turns out that was not the case, I felt like they kept telling me more and more bad news."

"I track the change by looking at my scans in depth. So for example, there has not been a significant change for my nodules in a year, but this is not necessarily true because if a doctor looks at my scans in depth, they have decreased in size about 0.02cm in a year. **That number may not be significant to the doctor because it's not a drastic change. But it does mean something to me.**"

Claudia Guevara, Age 26
Papillary Thyroid Carcinoma Stage 3

White Space
There's an area of opportunity to design for patients who are diagnosed with a chronic condition at a young age. It's an unexpected case that can cause more harm if a patient doesn't know how to approach the diagnosis.

Meet Jennifer (Primary User)

Jennifer Hampton
Rochester, MN
Age 23

Health Condition: Papillary Thyroid Carcinoma Stage 2

Her Story
Jennifer, a recent college graduate, was diagnosed at the age of 23 with Papillary Thyroid Carcinoma Stage 2. After her diagnosis, she felt lost and didn't know what to do. She felt like her life was over and that her life would be difficult moving forward. She started getting sick regularly but when she went to her primary care doctor for a check-up, she was told that she had the "good" type of cancer. She was told that all she needed was surgery but it didn't turn out how it was supposed to and she kept on getting bad news. She eventually had to go through 2 thyroidectomies, radiation, and oral chemotherapy. She's unsure of what her future holds and unfortunately, the cancer is incurable. She started taking medication and she will be on it for the rest of her life. The medication might stop working so she might have to go on a clinical trial. She appreciates her doctors for trying to help him, but **she doesn't feel like she's living the life she wants to live.**

Frustrations
She's frustrated with the difficulty of having to manage multiple patient portals, understanding her condition, and not knowing what to expect in the future.

Goals
Her goal is to manage her condition successfully through health data access and increased patient-provider engagement.

Passionate, Extrovert, Hopeful, Detail-Oriented

Jennifer's Timeline
February 2017 to Present

February 5, 2017	She started getting sick regularly.
May 15, 2017	She went to her primary care doctor for a check up.
May 16, 2017	X-Ray at St. Mary's Hospital
May 19, 2017	Diagnosed with Cancer at St. Mary's Hospital
May 25, 2017	Ultrasounds and Biopsy at the Mayo Clinic
May 25, 2017	Diagnosed with Papillary Thyroid Cancer at the Mayo Clinic
June 10, 2017	1st Thyroidectomy at the Mayo Clinic
October 10, 2017	2nd Thyroidectomy at the Mayo Clinic
December 12, 2017	RAI, Radioactive Iodine Treatment at the Mayo Clinic
August 7, 2018	Radiation to her Hip Bone
August 20, 2018	Oral Chemotherapy (Lenvima) at Rochester Methodist
August 12, 2019 and on	Check ups at St. Mary's Hospital

Other Personas (Use Case Scenarios)

Adam Johnston
San Diego, CA
Age 21, College Student
Health Condition: Severe Allergies

About
Adam is a college student at UCSD and he's almost ready to graduate with a bachelors in Business Administration. Throughout his college career, his parents have always been by his side to help him whenever he needed it, especially regarding his health because of his allergies.

Goals
Adam wants to be able to manage his health without the help of his parents since he'll be graduating soon. His goal is to become more independent with health management.

Frustrations
Because of his specific allergies, he has to see his doctors frequently but it makes it difficult to transfer records from his hometown since he lives 4 hours away.

Judy Sherman
Greenwood, IN
Age 44, Middle School Teacher
Health Condition: Gestational Diabetes and Anemia

About
Judy is a middle school teacher at Greenwood High School teaching 7th grade Math. She is a mother of 2 and has a loving husband, John. Unfortunately, Judy has to manage multiple diseases: gestational diabetes and anemia.

Goals
Her goal is to manage her doctor visits with ease so she doesn't have to be stressed out about something she shouldn't have to feel stressed about.

Frustrations
It's difficult for her to have to go from doctor to doctor to tell them how she's feeling. It can also get complicated when she has to manually manage her own health record with paper.

Claire Sandoval
Rochester, NY
Age 62, Retired Adult
Health Condition: High Blood Pressure

About
Claire is a retired project manager and she spends most of her time traveling with her husband, especially to different countries. She tries to keep fit by running every morning because she wants to be able to keep moving. Since she's getting older, she's worried that something will happen and expects that she will get a health problem soon.

Goals
Her goal is to stay active and fit to stay as healthy as possible. Even though she's fine now, she wants to know that she has access to educational resources on how to take of herself when she needs to.

Frustrations
She's easily frustrated by hospitals because of the difficulty of obtaining her health record when it's needed most.

Problem Summary

Unawareness
Patients are unaware of their rights on HIPPA and health records.

Communication
There's a lack of direct communication between a patient and provider outside of one-on-one appointments.

Time Consuming
The transfer process of health records is a time consuming process that includes waiting in a doctor's office to waiting records to be delivered.

Collaboration
PHRs leave out information that can be useful for patients such as how doctors are collaborating with your other doctors, along with clinician notes.

Barriers
There are numerous barriers to why patients don't use their patient health portals such as preference to speak to providers in person, not feeling the need to view it, privacy and security concerns, and not having an avenue to access it.

Patient Portal Structure
Patient health portals lack visual hierarchy, effective content structure, and visual appeal.

Patient Life
Doctor's don't consider how a patient wants to live as much as they consider their treatment options.

Narrative
Patient health portals lack a narrative that dehumanizes the patient.

Preparation
Chronic conditions could start in one's early 20s and most young adults aren't prepared if they're diagnosed.

Multiple Portals
The management of more than one portal is inconsistent and causes problems with data management for the patient.

Key Insights

1) Patients should not have to feel that they have to give up their day in order to access information they need. They have a **desire for ownership** and when something is withheld from them without their knowledge, it's becomes difficult to holistically take care of themselves.

2) Patient portals aren't being used because they're not offering an added benefit for the patient to keep going back to it. It acts as a tool to view information more than actively manage one's health. A patient should be able to **view information, intake it, and adapt.**

3) When a young adult is diagnosed with a chronic condition they weren't expecting to get, they feel that their future is dependent on their treatment and only their treatment because of how the current healthcare system acts. Patients should feel like they can still **strive for their life goals while balancing their treatment.**

So, what's missing?

The reason why patients don't take initiative to use their patient portal is because **people value a systematic healthcare approach where there lifestyle is also considered**, and not just their treatment. Current health portals lack a narrative and features that would help them understand on HOW to live their life with their condition.

> " A medical record that abandons narrative in favor of a list does more than dehumanize our patients. It also hampers a clinician's diagnostic abilities.

Dr. Suzanne Koven, MD
Primary Care Physician and Writer in Residence at Massachusetts General Hospital in Boston.

How Can We provide **young adults diagnosed with chronic conditions** the resources needed to understand **their condition**, plan for **their treatment**, and adapt it to **their desired lifestyle** with an accessible, hospital-wide system?

Methodology: Affinity Mapping (Coding on Atlas.ti)

Design Direction

My focus will be on the systematic approach for creating a service that offers a product for the healthcare provider and patient, along with a new and improved patient portal.

Service
This service can be accessed online and by anyone, patients and hospitals, in order to integrate a new method of data hosting on a cloud based system.
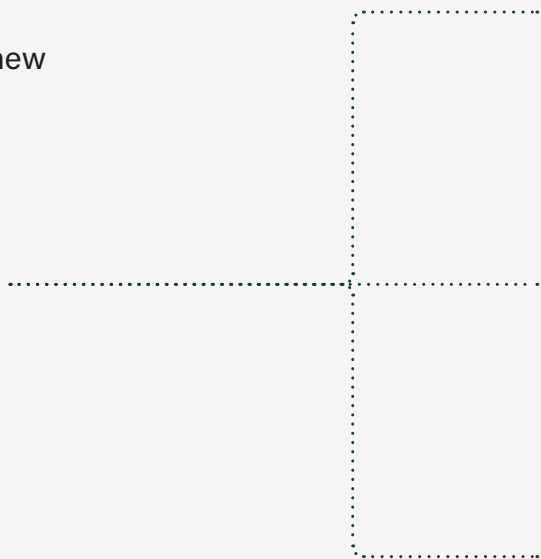
Hospital - Access Hub (Product)
This access hub will house information that can be accessed by any other hospital with the hub or portable asset, given that the provider gives proper clearance and credentials.

Patient - Portable Asset (Product)
The portable asset would act as a key or trigger in order to easily access information along with giving cleared ER staff the ability to obtain their medical ID or health record. This asset will give the patient a sense of privacy and security.

Patient - Portal (UI/UX)
The patient portal will be redefined and restructured to create a focal point on the patient's healthcare journey and lifestyle, along with extra features to enhance its' use.

Ideation

Looked into several portable assets such as key chains, biometric scanning, insurance cards w/scanning abilities. I also considered features for a better health portal such as a personalized dashboard, multiple portal management, and AI technology to scan and sort paper records.
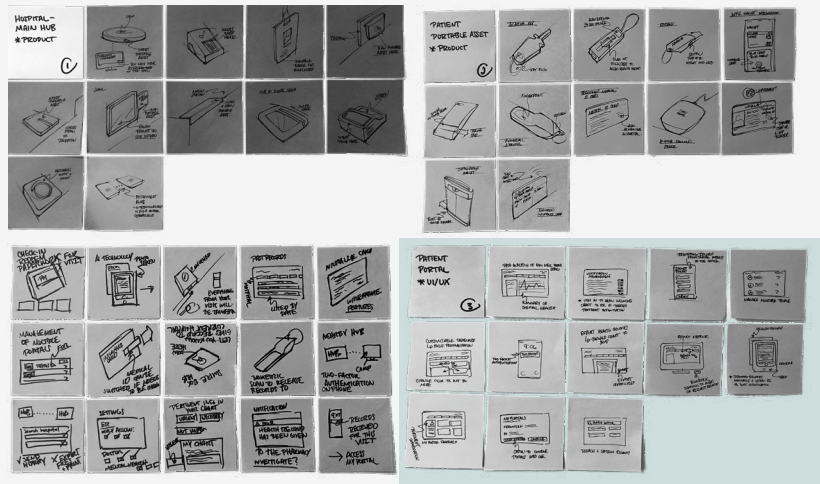
Patient portals has the most room for improvement and opportunity.

Concept Exploration + Refinement

Access Hubs
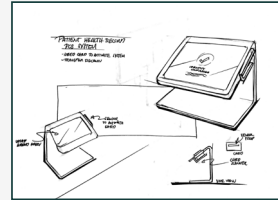
Card Swipe System
Similar to POS systems for purchasing items, this would also have a screen to give feedback when requesting records.
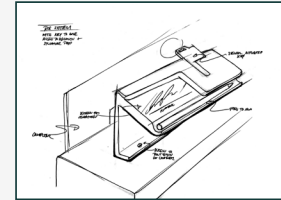
Keychain System
The keychain would be used as a sensor to unlock records and then you would have to sign for it (for added security).
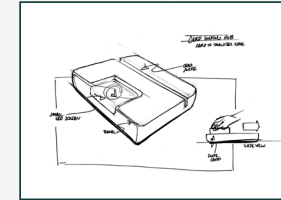
Swiping Hub
A card would be used as an authenticator to automatically assist in inputing information into the computer, along with output record information.
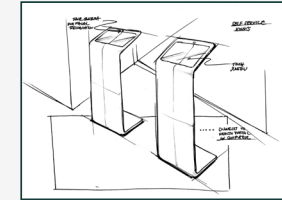
Health Record Kiosk
A card would be used as an authenticator to automatically assist in inputing information into the computer, along with viewing record information.
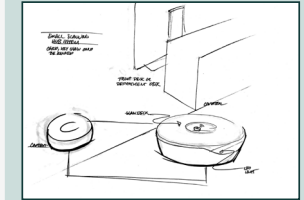
USB Connect
Device connects to computer desktop to access information and something can be scanned on it to release records.

Easier to implement compared to kiosks and other methods.

Portable Asset/Trigger
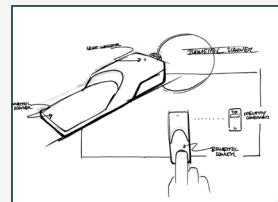
Biometric Keychain
A keychain would have biometric scanning in order to access and release records through a secure and private network.
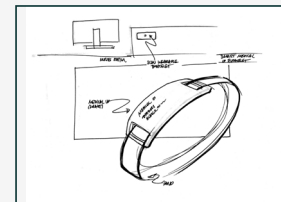
Smart Medical ID
The medical ID can be scanned at a device at the front of hospital departments in order to receive a visit summary from a single visit.
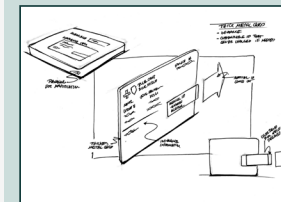
Insurance Card
The card would be revitalized with scanning capabilities and there would be a metal plate that could come off/on as a medical ID.
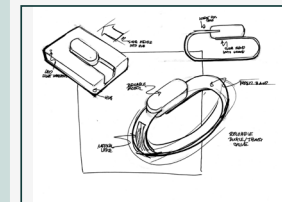
Patient Bracelet
The lock holding the bracelet together would also act as a key that can slide into a hub in order to access information.

Something patients already have, current card doesn't do anything except for displaying info.

Final Concept

The system is comprised of 3 main components: the hub (1) where the insurance card (2) can be scanned to release a patient's record to the universal portal (3).
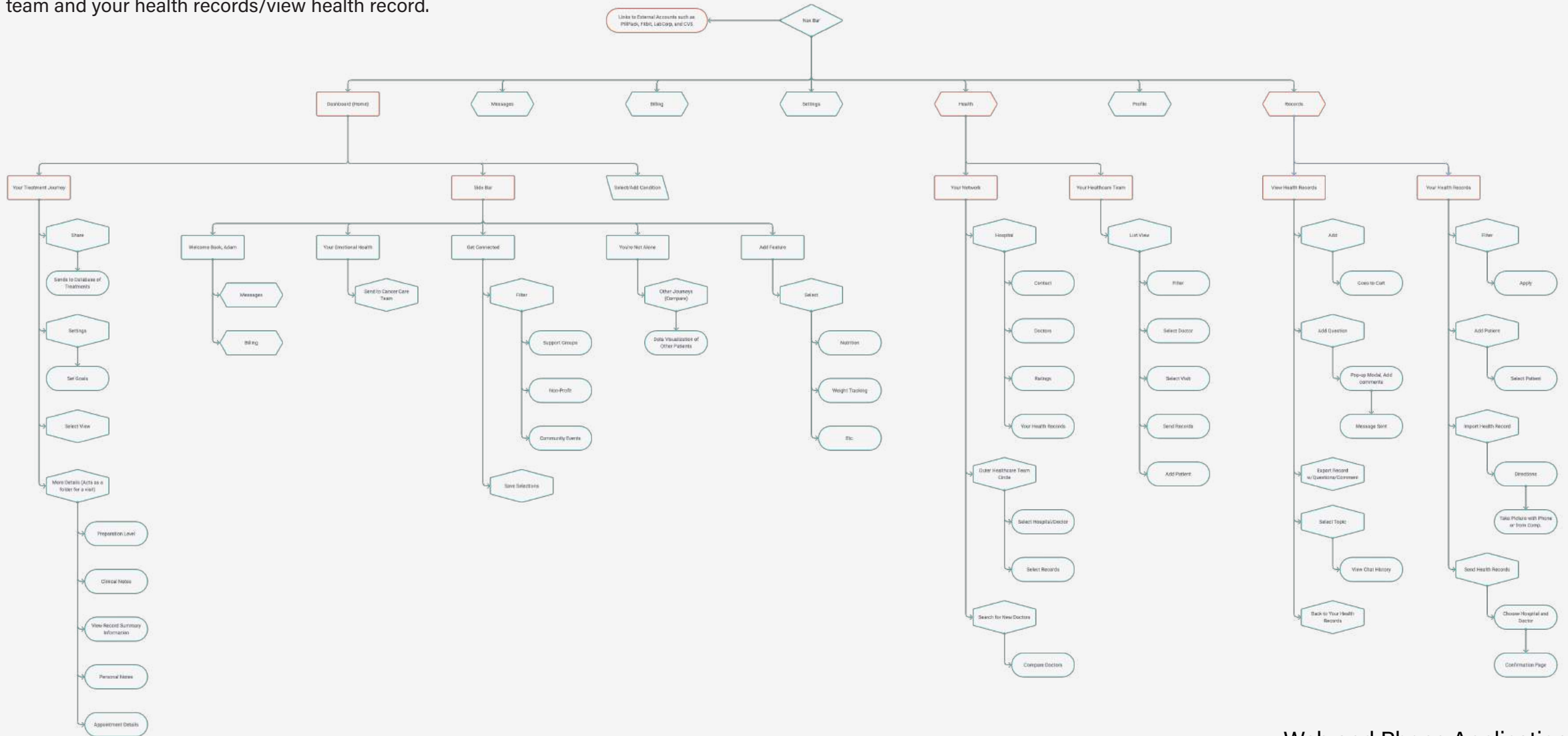
Your Network

Based on the patient's settings, records can automatically be transferred to their other doctors to keep each hospital up-to-date with a patient's records.

Insurance Card	Hospital/Department Hub	Universal Patient Portal

The insurance card acts like a trigger to release health records.

Dual-Factor Authentication

The patient has to approve access through the phone application or with a PIN number.

The hub connects to a computer with a usb cord in order to access information.

Health Record Transfer

The health record will always transfer to the universal patient portal and/or other hospitals if requested (optional)

*The universal patient portal will include **health management** tools.*

Hierarchal Task Analysis (HTA)

The HTA was carried out to understand the most important tasks patient's cared about which is tracking health records, learning about their specific condition and communicating with their care team.
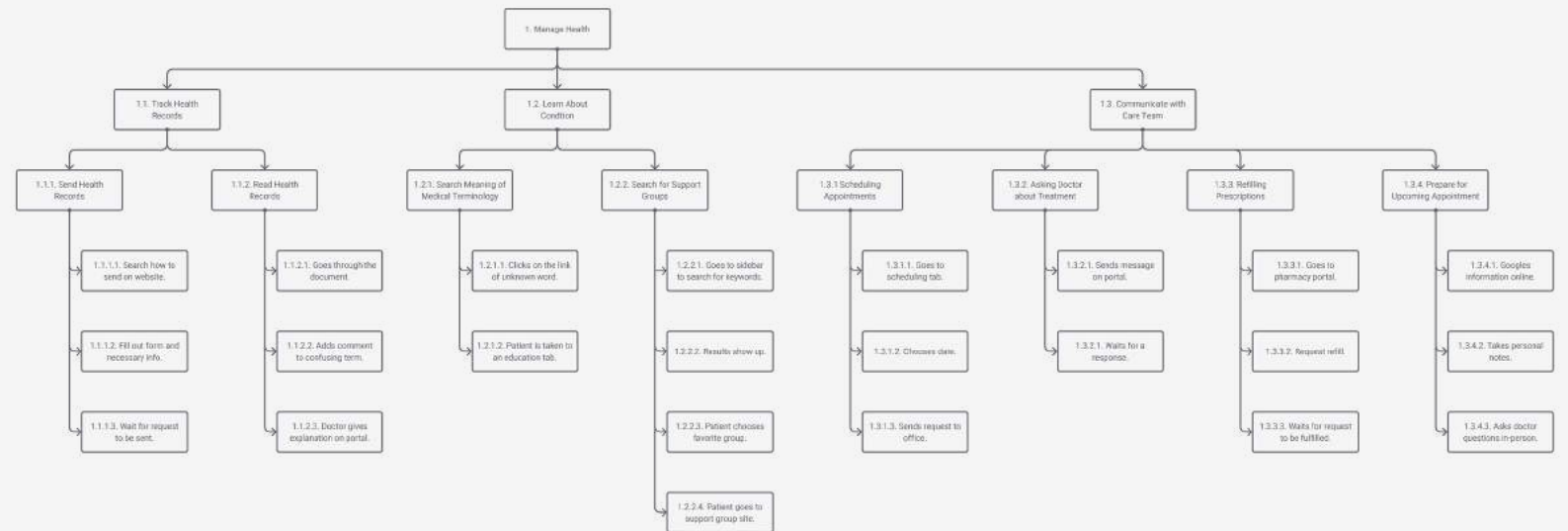
Site Map

The focal point of core is the health management tool - your treatment journey. Second to that, is your network/healthcare team and your health records/view health record.

Wireframes

The type of feedback I was looking for from my wireframes is the structure of the main page of the dashboard.

The card UI overcrowded the dashboard with too much information, the hero should be the treatment journey.

Users preferred lists when it came to records and viewing information but wanted more separation to make it easier to distinguish.

There's an opportunity to make the patients' network more visual appealing using a graph to make it easier to intake the information.

I worked with Claudia using an Agile Development Methodology to co-design a patient-centered solution.

1. "Next steps could be integrated into the journey instead of having a separate card. The calendar also doesn't need to be that big."

2. "I like the progress overview, it's nice to see where I'm at with my treatment."

3. "The 'Transfer Records' sidebar looks overcrowded to me, maybe it could be similar to how you add things in your cart when you're online shopping."

4. "Urgent and take action could be simplified into one. As long as I know it's of importance."

5. "If there was a way too add more than one receiver, that would help."

Web and Phone Application | 19

Core Patient Care System

The Core Patient Care System is comprised of 3 main components: patient portal, access hubs, and a revitalized insurance card. The system is designed for the patient being in the center of the healthcare interoperability system.

At Core, we're not just a network, we're a family.

Core gives you the personalization you need to manage your health with ease. Each patient portal is customized to one's specific condition to provide focused care outside of the doctor's office. With enhanced patient-doctor engagement, you're at the center of what matters most, your life.

Signing up is as easy as searching your provider's information on our universal database. We also have a platform to share your treatment journey with people just like you.

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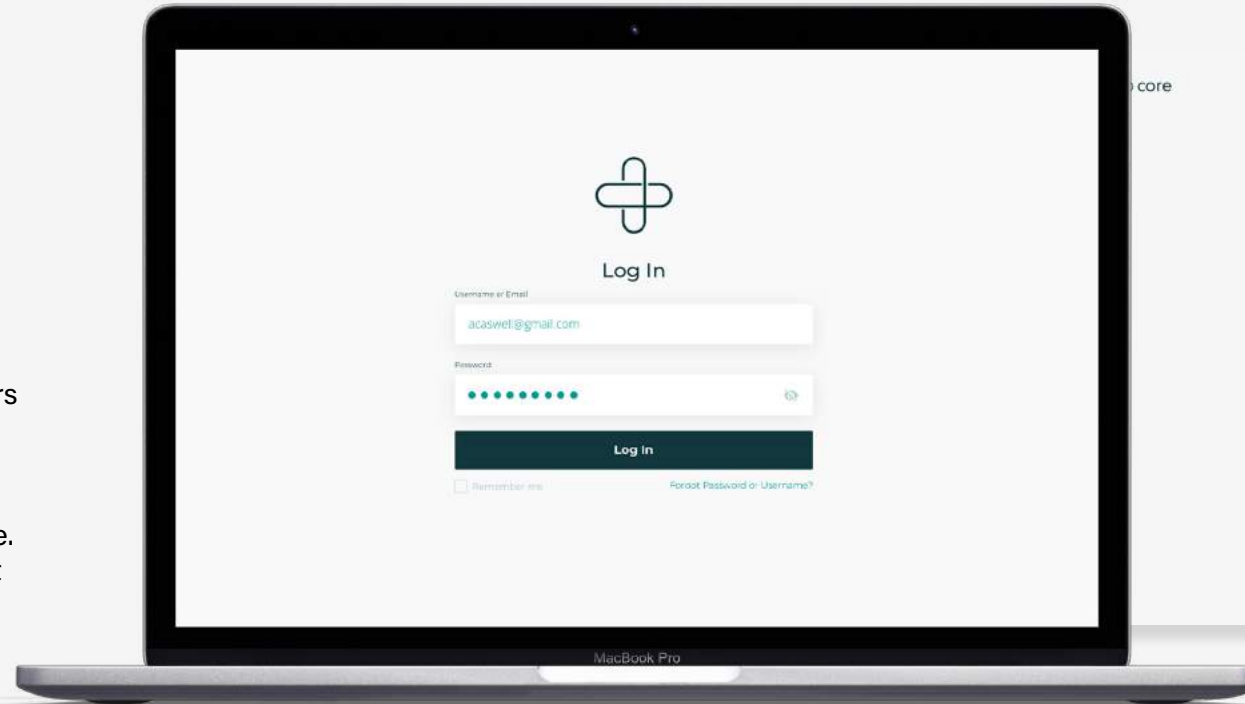
Your Treatment Journey

When you log in to your portal, the first thing you'll see is your *treatment journey*, which is an overview of your treatment plan that consists of appointments, plan of care, visit summaries and more.
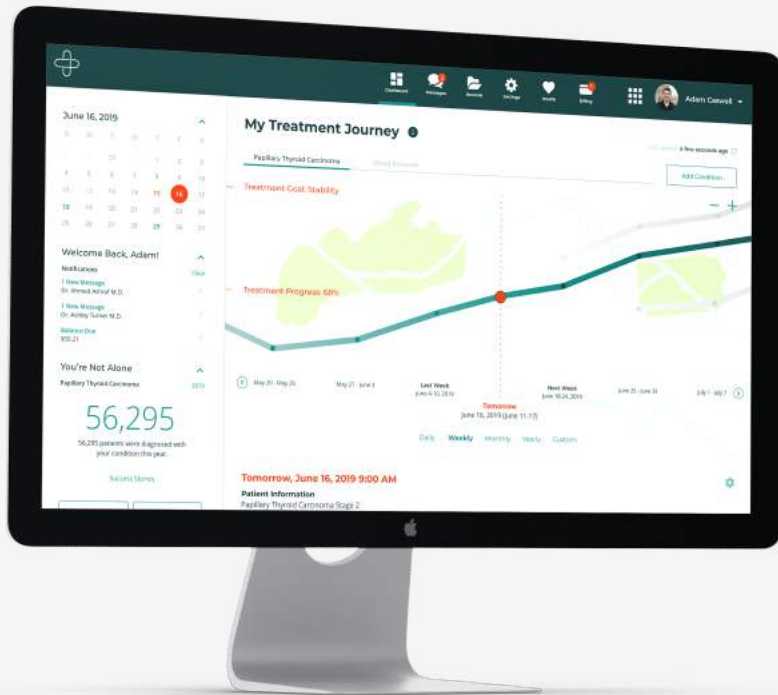
Pathways

A treatment plan is never 100% guaranteed but just because something doesn't go well, doesn't mean you're moving backwards. This feature allows you to prepare for any type of outcome or possibility during any stage of your treatment journey, just click on any path and it'll give you the information you need.
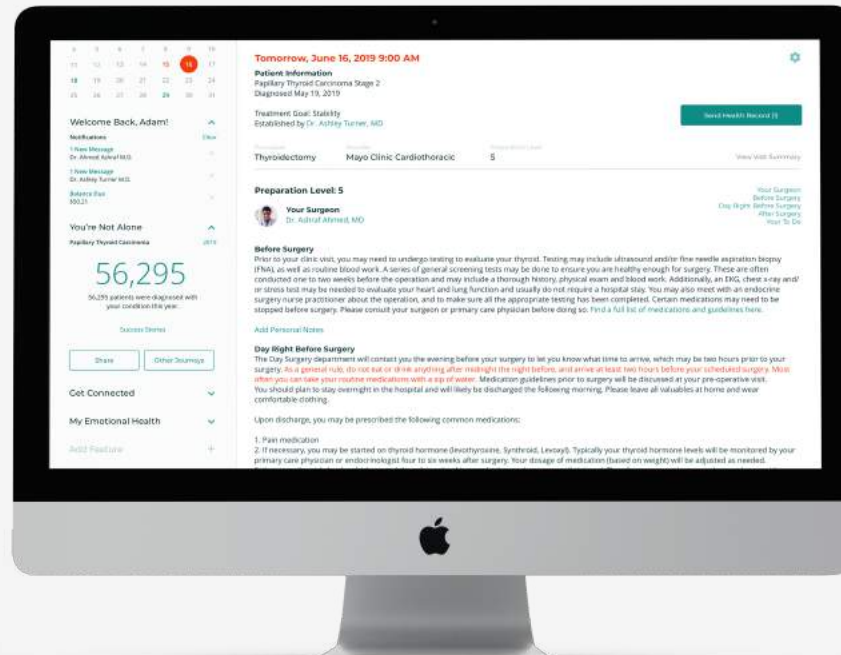
Preparation Level

Each appointment will have a preparation level that is determined by your provider. When clicked on, information in regards to that appointment will be provided. For example, if you have an upcoming surgery, Core will be able to tell you what you need to do before and after surgery such as fasting for 12 hours beforehand.
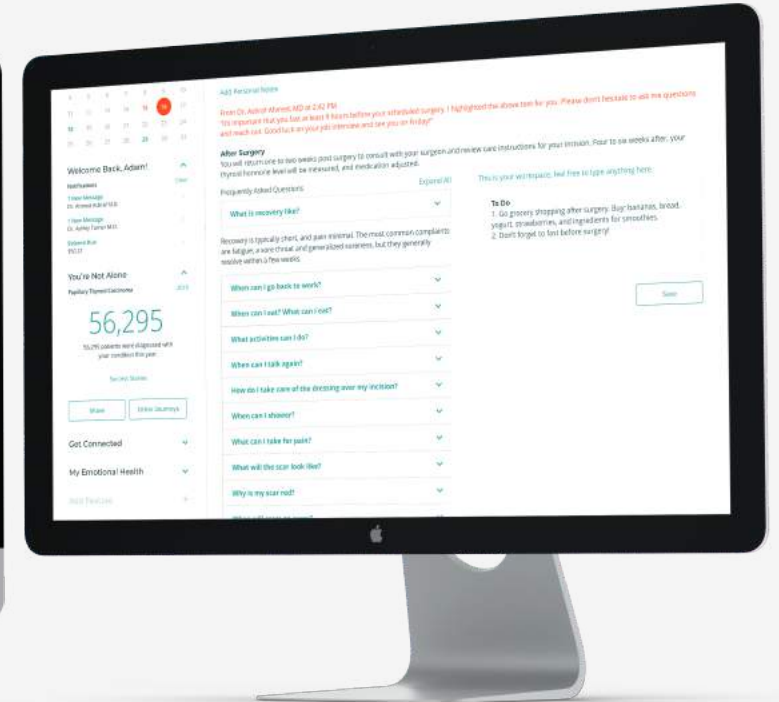
Workspace

Each appointment you have will have a workspace where you can add personal notes, comments, or even message your doctor. This space acts similarly to a folder on a computer where everything that is related to that appointment will be housed. You will also be able to view frequently asked questions and customize notifications to be sent to your phone.

Customized for you and your condition.

People with chronic conditions feel like they're tackling their disease by themselves when in reality, there are thousands. On the customizable sidebar, there are features that are specified to your treatment and condition, along with the ability to add multiple conditions on the dash.

You're Not Alone provides you the ability to connect with people just like you to share your stories and to see how their treatments are going.

Get Connected will allow you to connect with support groups and non-profit organizations that are related to your condition to help you get adjusted to your particular community.

My Emotional Health is a resource for anyone who may be experiencing depression or suicidal thoughts because of their diagnosis. Being diagnosed with a chronic condition is a life-changing event and at Core, we want to express that it's okay to not feel okay. With this feature, patients are able to connect with mental health staff such as a therapist.

**Other features** include nutrition, cookbooks, exercise plans, etc.
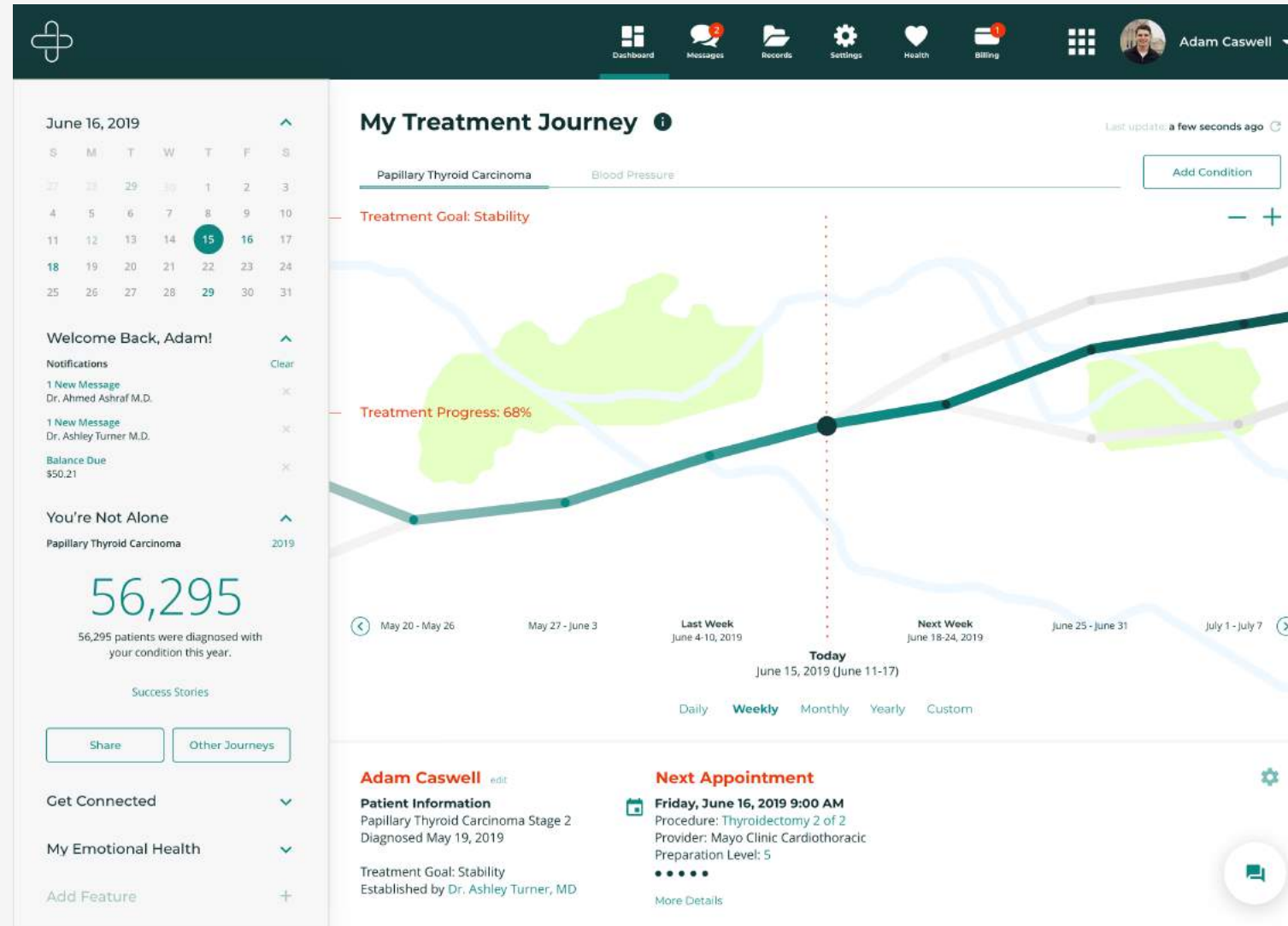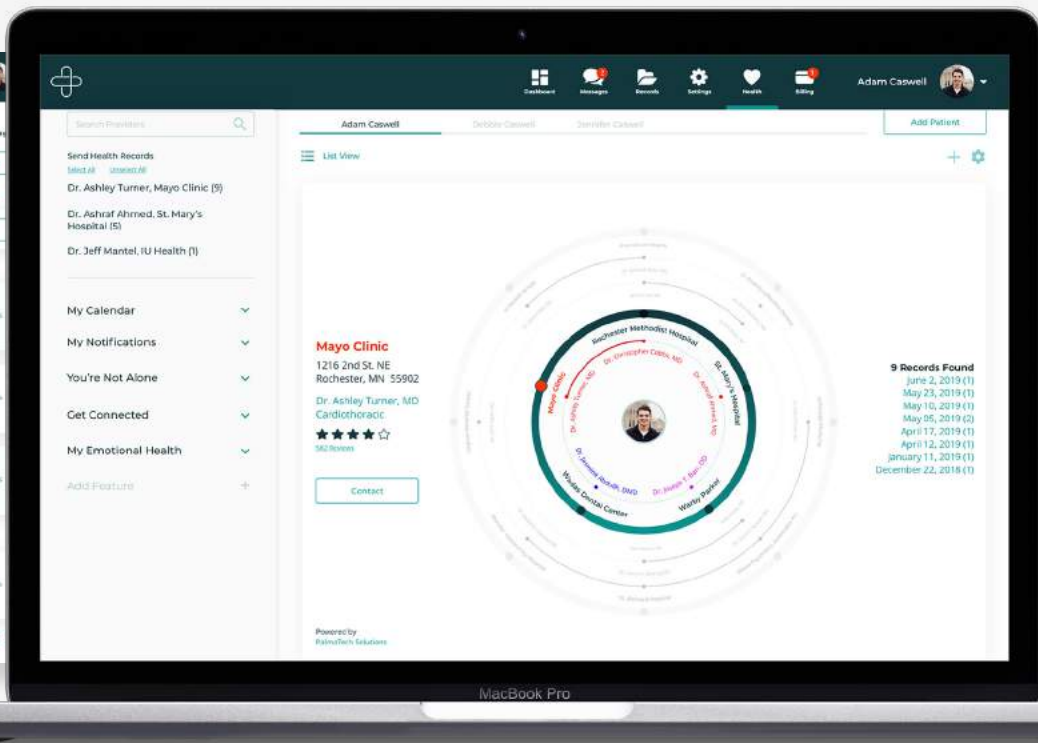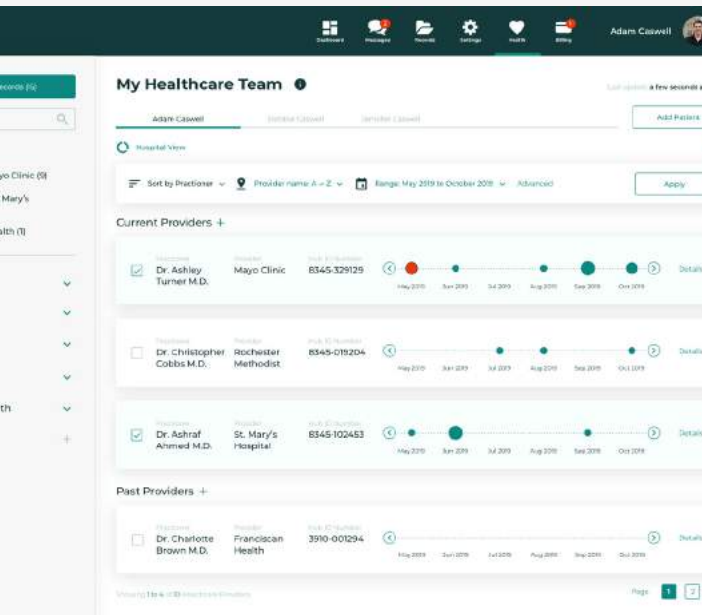
Your Network and Healthcare Team

This feature allows you to view your current healthcare team, along with your past providers. Having a full history of your care team makes it easier for you to track your records, whether it's transferring or viewing.

Each provider also has a **Hub ID Number** attached to their profile. This means that they are a part of the Core network where records can be automatically transferred and updated whenever you go to an appointment.
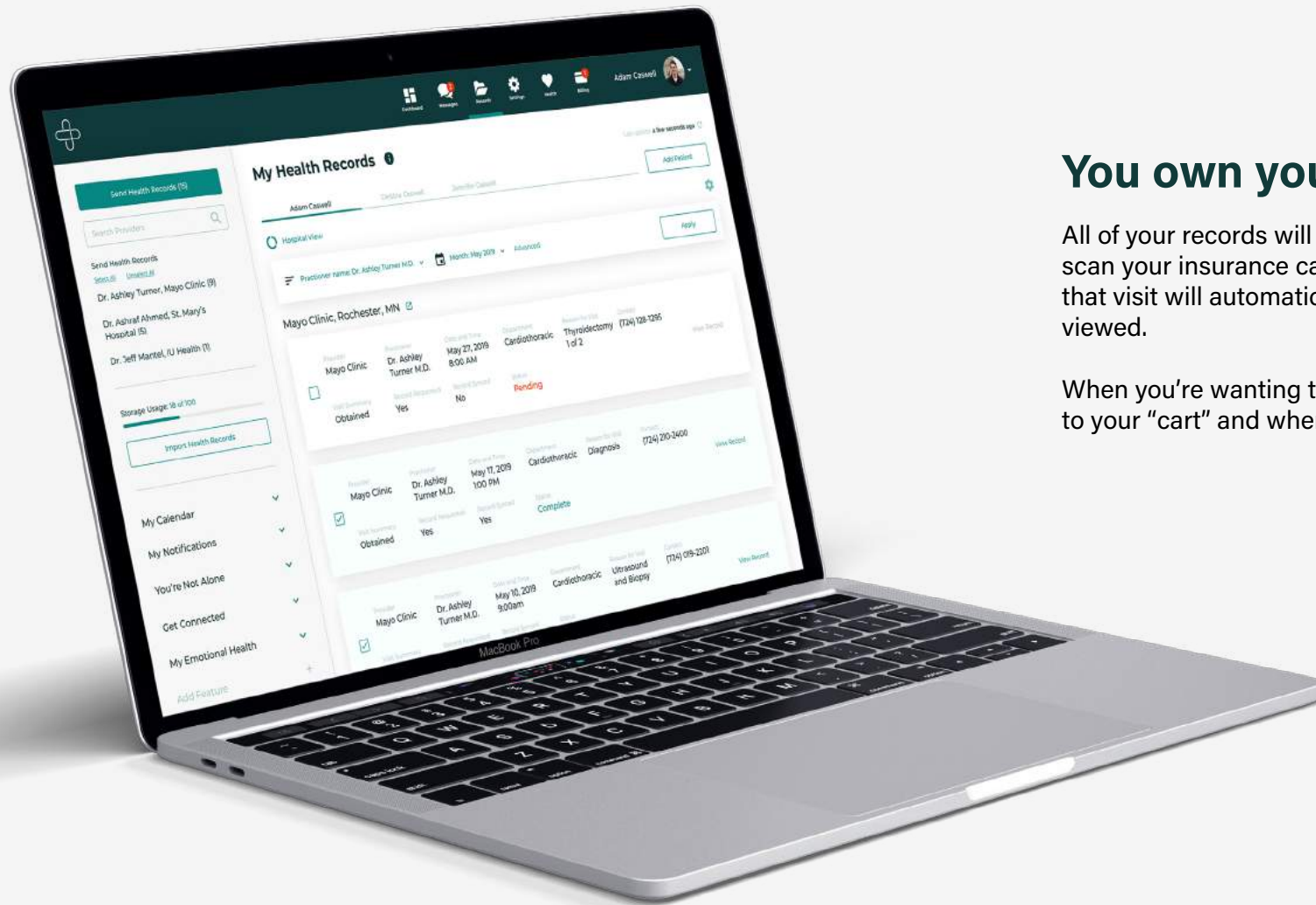
You own your records.

All of your records will be compiled into one location and every time you scan your insurance card at one of our access hubs, your record from that visit will automatically be transferred to your universal portal to be viewed.

When you're wanting to send your records, all you have to do is add it to your "cart" and whenever your ready, click the send button.

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Patient-provider communication couldn't be better.

Medical charts can be daunting to look at with medical jargon that you may not be able to understand, along with long formatted pages. At the top of your medical chart, your doctor will highlight pertinent information that requires your attention first, where a quick link will take you directly to the correct page. You're also able to highlight anything on the medical chart that you may not understand to ask your doctor to clarify. This will cause a chat box to appear with the topic on the top.

Sending health records is as easy as 1, 2, 3.

With a universally connected system, any hospital with an access hub can receive your records in a flash.
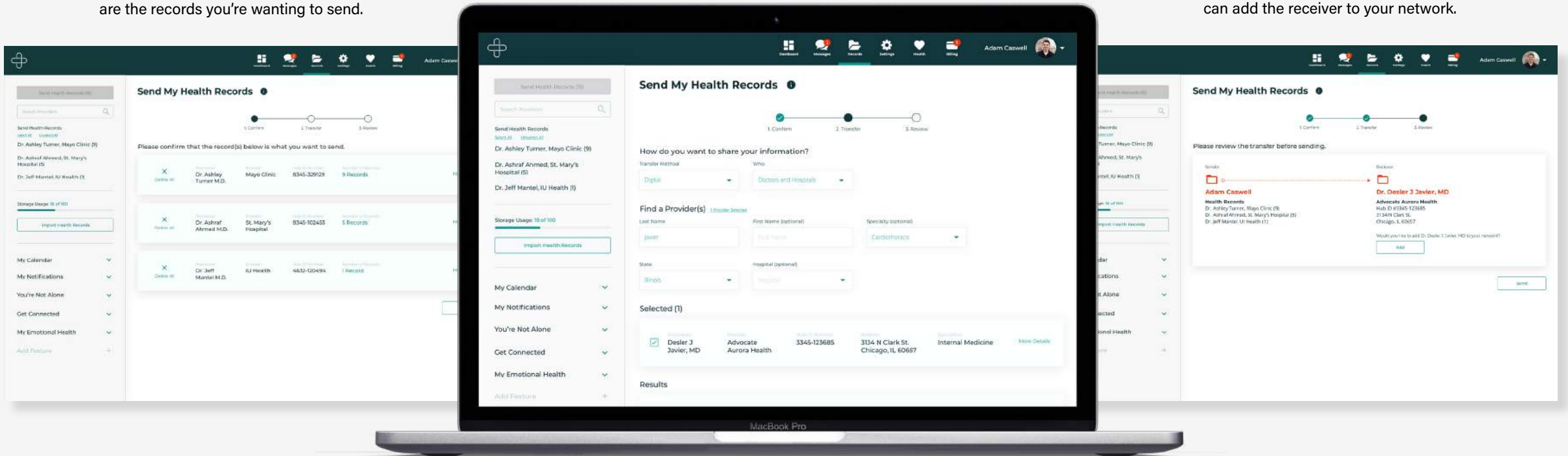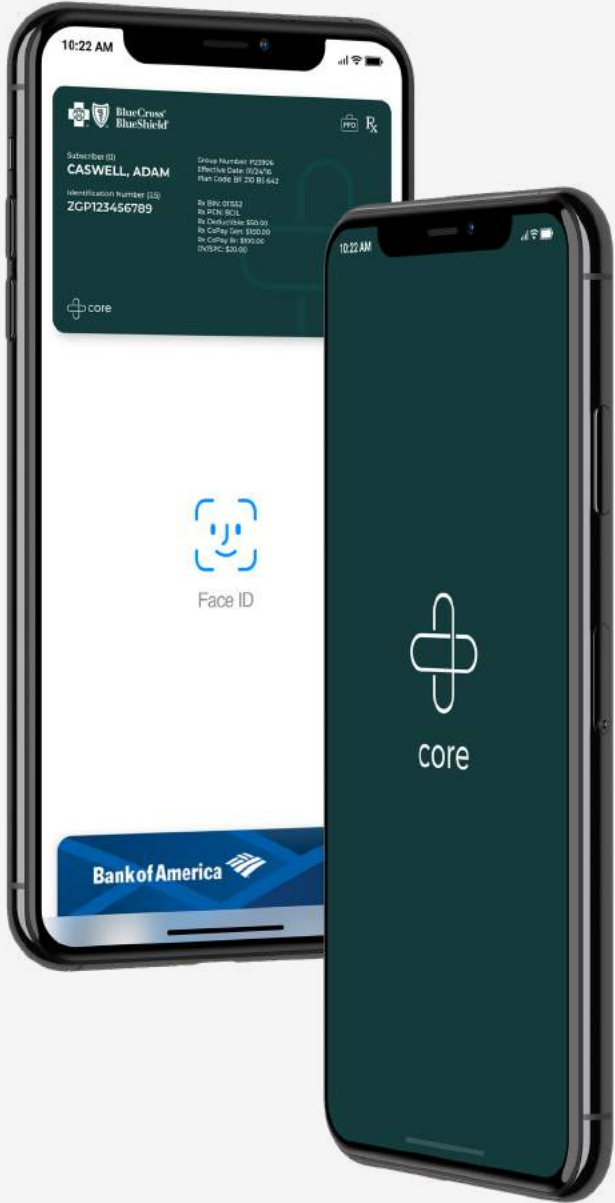
Step 2: Transfer
Select the transfer method and who the receiver is.
Then, find the providers you want to send it to.

Step 1: Confirm
Confirm that the records you have selected are the records you're wanting to send.

Step 3: Review
Double check that you're sending your records to the right receiver. If need be, you can add the receiver to your network.

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Insurance Card

The revitalized insurance card will be your key to transferring your records whenever you visit your provider. All you need to do is scan your card and let the magic happen! When scanned, your record for that visit will be requested and pending finalization.

Access Hub

The access hub will be located at the front desk of each department if they're in the Core network. Each hub has it's unique Hub ID Number where records can easily be tracked. The hub connects to the computer through USB. When a card is scanned successfully, there will be a sound and the light will flash green to give the user feedback.

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Dual-Factor Authentication

In order to keep health records private and secure, patients are required to go through a dual-factor authentication process on their phone or in-person to verify their identity.

When you card is scanned at a hospital/department hub, you will receive a notification for access request. Once the request is fulfilled, you will receive another notification stating that the record is syncing to your patient portal.

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