CAPSTONE PROJECT

Solving Health Data Fragmentation for Patients

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August 28, 2025

Agenda

1 Roadmap

2 Desk Research & Competitor Analysis

3 Screener Survey & User Interviews

4 Wireframing & Prototyping

5 Usability Testing & Insights

6 Final Prototype

7 Next Steps

1

Previous Class

May 13 - July 1

- Problem Exploration
- Screener Survey
- User Interviews
- User Narrative

2

Planning & Researching

July 10 - 17

- Project Plan Blueprint
- Project Management Tool
- Desk Research
- Competitive Analysis

3

User Interviews & Personas

July 17-24

- Conduct User Interviews (9 participants)
- Analyze User Interviews
- Personas (2)

4

Designing

July 24 - 31

- Journey Maps (Current & Future States)
- Mood Boards

5

Prototyping

July 31 - August 7

- Wireframes
- Design System
- Low-Fidelity Prototype

6

Prototyping & Planning

August 7 - 14

- Figma High Fidelity Prototype
- Write Usability Test Script
- Gather Participants

7

Usability Testing & Iteration

August 14-21

- Conduct Usability Tests (5 participants)
- Analyze Results
- Iterate on Final Prototype Designs

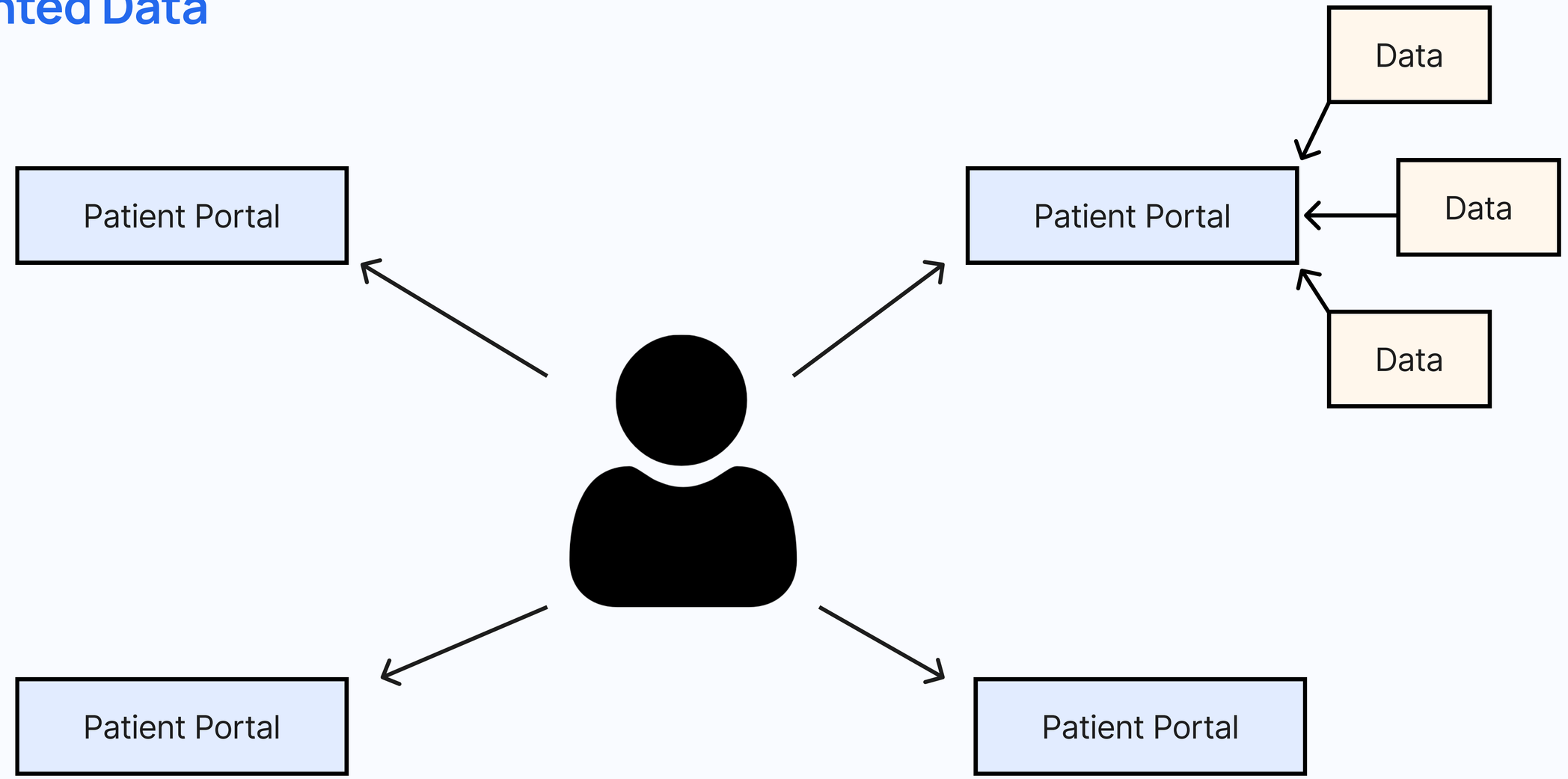
8

Presentation & Deliverables

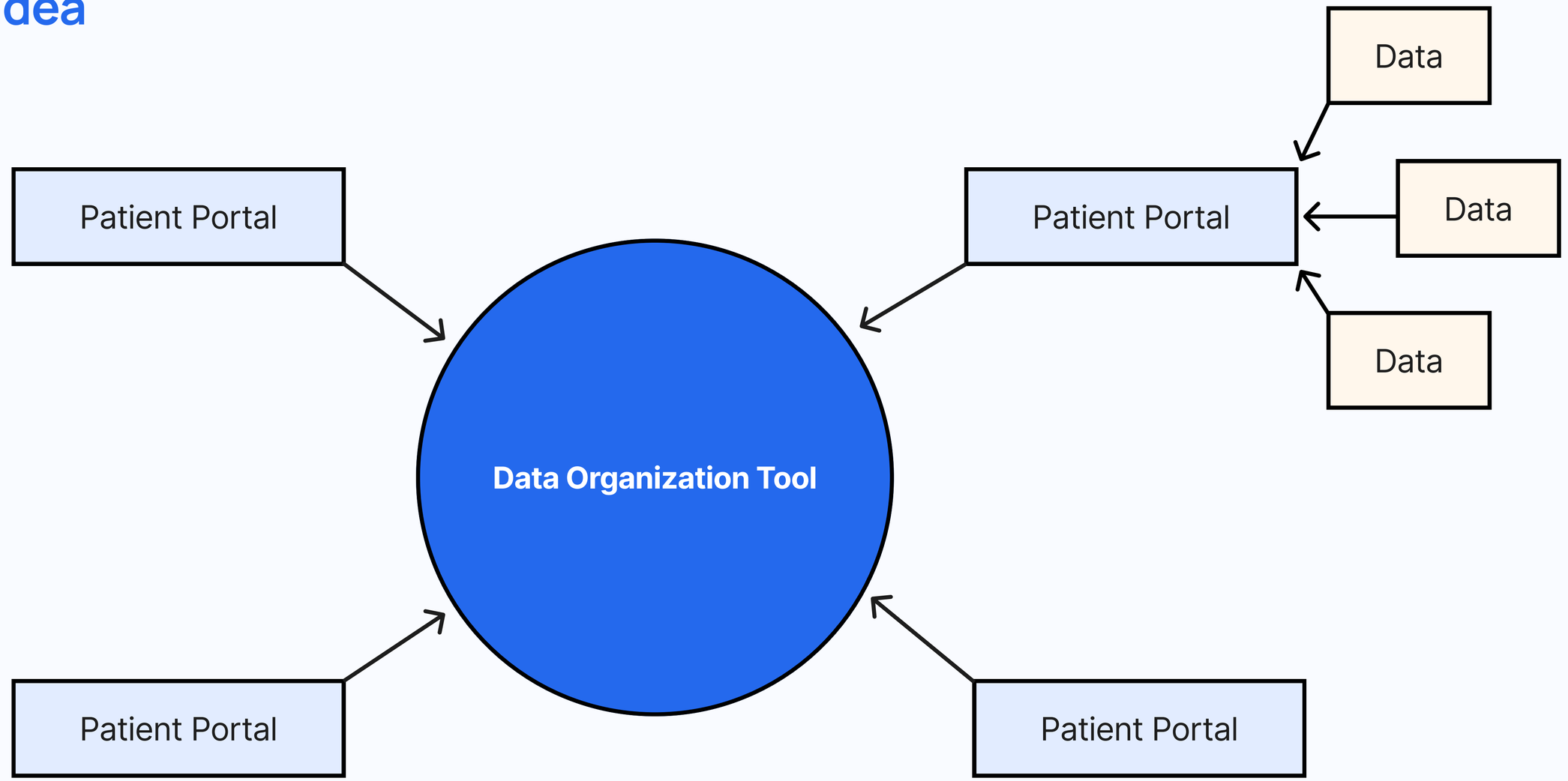
August 21 - 28

- Make final presentation
- Add project to portfolio
- Gather deliverables

Fragmented Data



Project Idea



Problem Statement

“The individuals who manage or receive care across multiple medical systems experience fragmented medical data, which leads to overwhelming stress, communication issues, and delays in care. Solving this problem will reduce the emotional burden on patients by helping them manage, track, and share their health information more easily. This is important because individuals can easily access medical data in a centralized and up-to-date location resulting in improved health outcomes.”

[stakeholder group]
[problem]
[negative impact]
[positive outcome or benefit]
[reason/impact]

Desk Research - Feasability

Patient Legal Rights

Patients legally have the right to access and share their health data.

Interoperability Exists

SMART on FHIR (Fast Healthcare Interoperability Resources) APIs allow third-party apps to pull data from Epic, Cerner, Allscripts, etc.

Secure & Compliant

HIPAA safeguards, encryption, user consent, audit trails required.

Competitive Analysis

Direct Competitors
Patient-Facing Portals & Aggregators

- **Companies:** Epic MyChart, OneRecord, PatientMpower, CareSpace
- **Strength:** Provide patients direct access to their medical records and test results in one place.
- **Weakness:** Limited to single-system data (MyChart) or basic aggregation without caregiver/multi-profile support (OneRecord, PatientMpower).

Indirect Competitors
Condition-Specific or Practice Management

- **Companies:** Tempus Olivia, DRChrono/OnPatient, Azumio (Argus, Sleep Time)
- **Strength:** Highly tailored to niche use cases (oncology, fitness tracking, or practice efficiency).
- **Weakness:** Not designed for managing multiple systems or giving a full-picture medical history for complex patients/caregivers.

Back-End Competitors
Data Networks & APIs

- **Companies:** Health Gorilla, Redox, Lumiata, Otto
- **Strength:** Strong technical backbone for data exchange and integration across systems.
- **Weakness:** Not patient-facing; they solve interoperability at the provider/developer level, not at the patient or caregiver level.

Maya Thompson

Chronic Illness Patient

- **Age:** 22 years old
- **Health Conditions:** Lupus
- **Years Managing Diagnosis:** 3 years
- **Hospital Systems:** 3 (Epic, Oracle Health, eClinicalWorks)
- **Specialists:** 4 (Rheumatology, Nephrology, Dermatology, Cardiology)

Goals:

- Wants to feel less overwhelmed managing her chronic illness
- Wants to feel more in control of her healthcare journey

Needs:

- See all test results in one place
- View past and future appointment visits
- Get medical data to providers
- Organize old and new medical data
- Easily prepare for new appointments

Pain Points:

- Managing multiple patient portals
- Understanding lab results
- Sharing medical records with physicians
- Advocating for appropriate medical care
- Keeping up with appointments

Rachel Turner

Mother/Caretaker

- **Age:** 38 years old
- **Children with health conditions:** 2
- **Hospital Systems:** 4 (Epic, Oracle Health, eClinicalWorks, NextGen Healthcare)
- **Specialists:** 5 (Allergist, Pulmonologist, Rheumatologist, Dermatologist, Gastroenterologist)

Goals:

- Doesn’t want to miss any important information about her children's health
- Wants to spend less time managing health documents and more time with her family

Needs:

- Easily switch between medical profiles
- View past and future appointment visits
- Get medical data to providers
- Receive reminders and notifications
- Easily understand medical data

Pain Points:

- Managing multiple patient portals
- Understanding lab results
- Sharing medical records with physicians
- Keeping up with each child’s medical needs
- Forgetting appointments

Screener Survey

Target User Groups:

1. Chronic Illness Patients
   - Managing multiple portals & specialists
2. Parents / Caregivers
   - Juggling children's portals & proxy logins
3. Physicians
   - Relying on incomplete or fragmented data

Screener Survey Responses (3 versions):

- 46 respondents with chronic illnesses
- 1 caregiver/parent respondent
- 4 physicians

9 User Interviews

45 minute Zoom calls

Chronic Illness Patients:

Number Interviewed: 4

- How they manage care across multiple systems
- Impact of fragmented data on appointments and care
- What they'd want in a unified dashboard

Caregiver/Parent:

Number Interviewed: 1

- Managing multiple children's portals
- Struggles tracking appointments, test results, and communication

Physicians:

Number Interviewed: 4

- How and where they receive patient data
- What information they rely on most
- Impact of missing/incomplete data on care

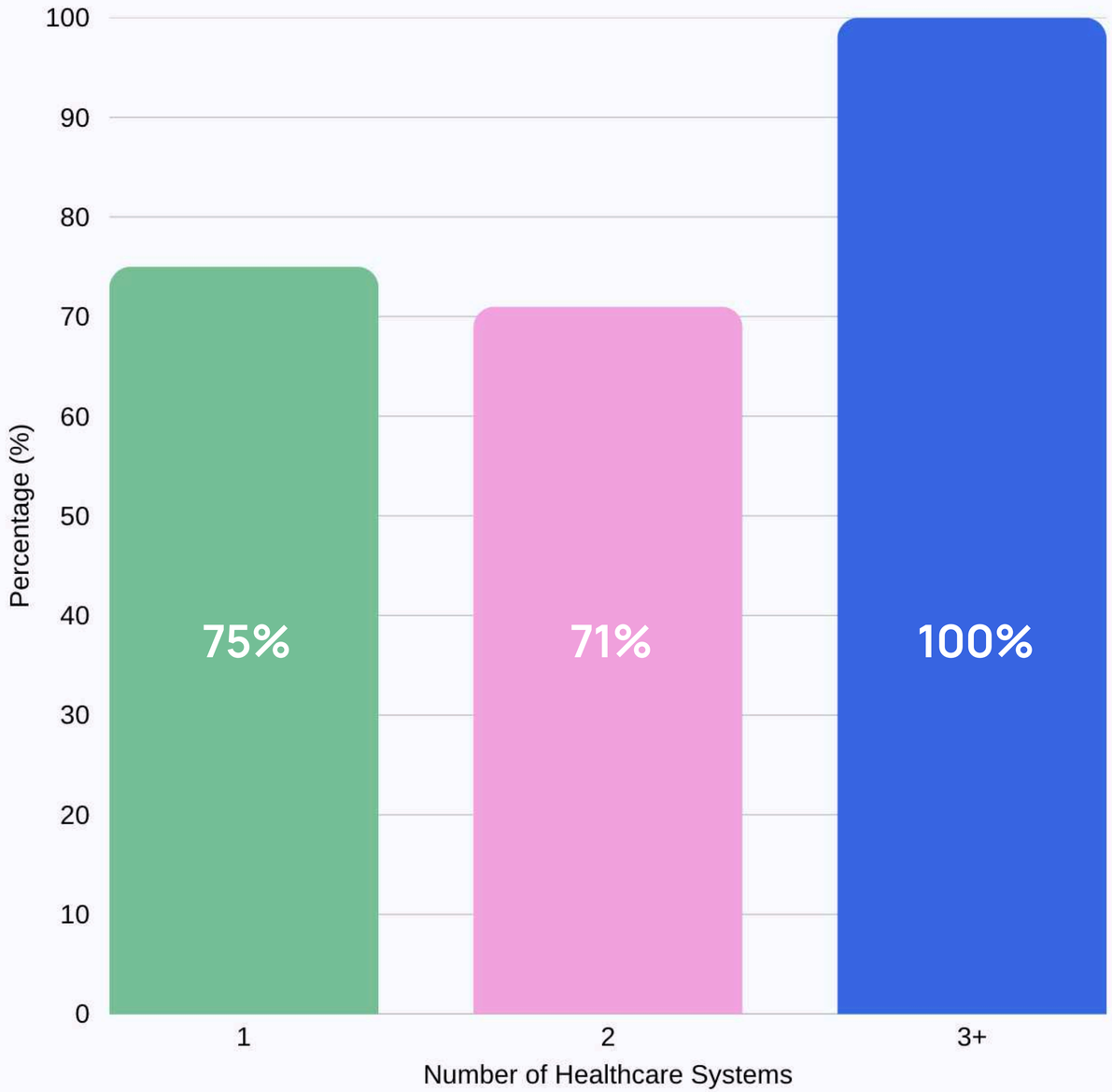
Negative Experiences Managing Medical Information

Screener Survey - Chronic Illness Patients

75% of users managing **1** healthcare system reported negative experiences

71% of users managing **2** healthcare systems reported negative experiences

100% of users managing **3+** healthcare systems reported negative experiences



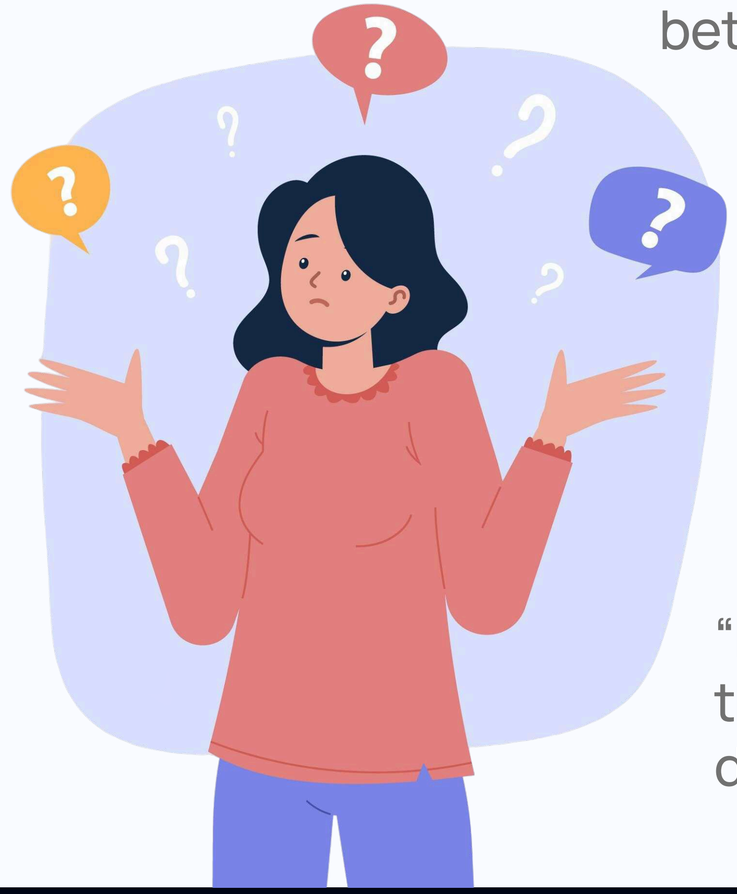
The Emotional & Medical Cost

Chronic Illness Patient Quotes

“Annoyed… it’s a pain!”

“Overwhelmed and wish I had a better system .”

“It’s a full time job.”



“Stressed and ill equipped!”

“It’s a struggle and very difficult to manage.”

“It can be overwhelming managing all the appointments, labs when you don’t feel well.”

Parents

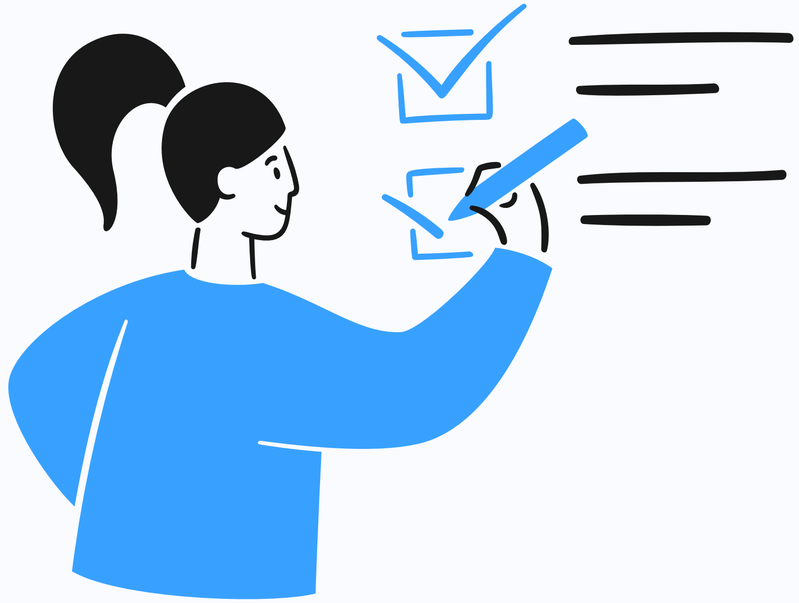
- Managing multiple children's records across systems is confusing and time-consuming
- Missed notifications, reminders, and abnormal results due to scattered data
- Wants a way to see everything in one place, get alerts, and switch between profiles easily

Physicians

- Still rely heavily on fax, scanned records, or patient handoffs
- Missing or fragmented data delays care and causes duplicate testing
- Most want scannable summaries: labs, history, medications, prior visit notes
- Open to patient-generated summaries if accurate and clearly organized

Ultimately...

All three user groups were struggling and VERY interested in a solution



Considering All Design Opportunities

Chronic Illness

Chronic Illness Patients (e.g., Maya)

1. Unified Medical Dashboard

Why: Patients like Maya currently log into 3–5 portals weekly to manage appointments, messages, test results, and bills.
"I log into different portals constantly, just to check if a message or test result is in yet."
→ A centralized dashboard consolidates fragmented data, minimizing stress and improving oversight.

Multi-System Integration Panel
- Connect to different health portals (via patient OAuth, API, or PDF upload).
- Show all linked health systems in one place with status (connected, needs login, etc.).

Test Results
- Grouped by date, provider, and type.
- Highlighted abnormal results.
- AI-generated plain-language summaries with links to original documentation.
- AI-identified trends (recommend questions to ask doctors)

Messaging Center
- Unified inbox showing all messages from linked providers.
- Tag or prioritize messages (e.g., follow-up needed, results pending, etc.).

2. AI Assistant

Why: Maya cross-references symptoms in Notes, menstrual apps, and Google Docs before appointments. She also needs to resend lab results manually.
"I wish I had something that could help me prep and know what to ask."
→ The AI could summarize trends, flag missing info, and generate questions based on test history.

Create Relevant Appointment Packets
- Select from uploaded/imported/scanned documents
- Manually add more by upload/import/scan
- Get all stuff together by using AI or manual
- Can be made with relevant data for unique specialist appointments (ex: don't need to add mental health data to an appointment with a nephrologist)
- AI generate medical history (summary) based on all inputted data
- AI Suggested/manually added questions

Test Result Summaries
- Note trends
- Highlight patterns
- Recommend questions to ask/tests to run
- Note abnormal results

Generate Medical History Summary
- Medical timeline with links to relevant data

Answer questions
- ? Maybe not allow this - only reference things like mayo or Cleveland clinic?

Searchable Medical Timeline
- Central record of diagnoses, labs, medications, and major events.
- Tag events by symptoms, conditions, or specialists for faster retrieval.
- Could utilize AI to support natural language style questions.

3. Automated Document Collection & Organization

Why: Interviewees described the challenge of gathering records from years of appointments, especially for disability claims or new doctor visits.
"I have a huge binder from trying to get disability... it took weeks."
→ Auto-import tools (via FHIR APIs or PDF scan upload) can organize and timestamp medical records.

Upload/Import/Scanning Tools
- Can select type for organization like blood tests, scans, appointment notes, etc

4. Smart Reminders and Alerts

Why: Appointments, billing dates, and lab availability often go unnoticed or arrive out of sync.
"I missed an appointment because it was listed wrong in one portal."
→ Smart reminders, flagged inconsistencies, and prompts to follow up improve adherence.

Appointments & Reminders
- Calendar view & List View
- Chronological timeline of all upcoming & past appointments (across systems).
- Smart alerts for incomplete follow-ups, unresolved results, or upcoming labs.

5. Personal Health Timeline + Tags

Why: Chronically ill users often track symptoms, flares, and medications over long timeframes.
"I have a Google Doc timeline but it's messy."
→ A dynamic, taggable health timeline with AI-searchable entries would help track patterns over time.

6. Intake Form Assistance
- Users can fill out once here and then refer back to it
- Has typical intake questions & users can add more
- Offer fill recommendations based on connected patient portal information?

7. Bill & Insurance Overview (Optional Phase)
- Track outstanding medical bills across systems.
- Upload EOBs and insurance documentation.

Caregivers/Parents

Caregivers / Parents (e.g., Rachel)

1. Family View with Multi-Patient Management

Why: Parents like Rachel manage multiple portals for each child, each with unique logins, formats, and hospitals.
"Even just checking test results takes me half an hour per kid."
→ A single login showing all dependents' relevant info allows easier oversight.

2. Proxy Access Controls by Age

Why: Caregivers want access—but also need to respect adolescent privacy (as required by HIPAA or portal policy).
"I want to see everything now, but eventually I know my kids need privacy."
→ Role-based access should adapt as the child ages (e.g., limited views at 12+, editable settings).

3. Appointment & Test Result Summary by Priority

Why: Rachel doesn't have time to read through pages of lab data for each child.
"I feel like I'm missing something because I can't go through it all."
→ A dashboard that highlights abnormal results, upcoming follow-ups, and needed action saves time.

4. Prep Tools for Appointments

Why: Rachel wants a system to generate questions and send notes ahead of the visit.
"So much time is wasted repeating things, especially if results didn't transfer."
→ A form-based tool or AI feature to create "Visit Packets" for each child would streamline the process.

5. Integration with Calendar

Why: Caregivers juggle appointments, medications, school notes, therapy reminders, etc.
"It's just a lot to remember. One missed thing can cause a spiral."
→ Unified calendar integrations with exportable summaries and alerts reduce cognitive load.

Physicians

Physician

1. 'Patient packet' with the provider in mind

Why: Alice confirmed a tool like this would be helpful if it's curated and accurate.
Idea:
- Simple - Include just what doctors value most:
  - recent labs
  - imaging results
  - current meds
  - visit summaries
- Allow easy export/print/email for patients to hand off at visits
- Note source info (uploaded by patient, imported from MyChart, etc)

2. Accuracy & trust for data

Why: "If it was updated accurately" is key!
Idea:
- Label each item with its source
  - e.g., "Uploaded by patient," "Imported from MyChart," "Scanned from lab"
- Timestamp all records (date of last update)

3. AI Role: Assistant, Not Diagnostician

Why: Physicians worry about AI misinterpreting data.
Idea:
- Use AI for summaries & organization
  - Yes: "5 tests since last visit," "3 medication changes"
  - Avoid: "This means X" medical interpretations unless linked to vetted sources like Mayo Clinic or NIH.

4. Provider Review Periods

Why: Physicians value that 48-hour review window.
Idea:
- Clearly label what has/has not been reviewed if possible
  - Show once reviewed?

5. Accurate Medication List

Why: Discrepancies between systems cause issues.
Idea:
- Include a "medication list checker" that highlights conflicting or duplicate entries from different providers.

6. OCR for Scanned Documents

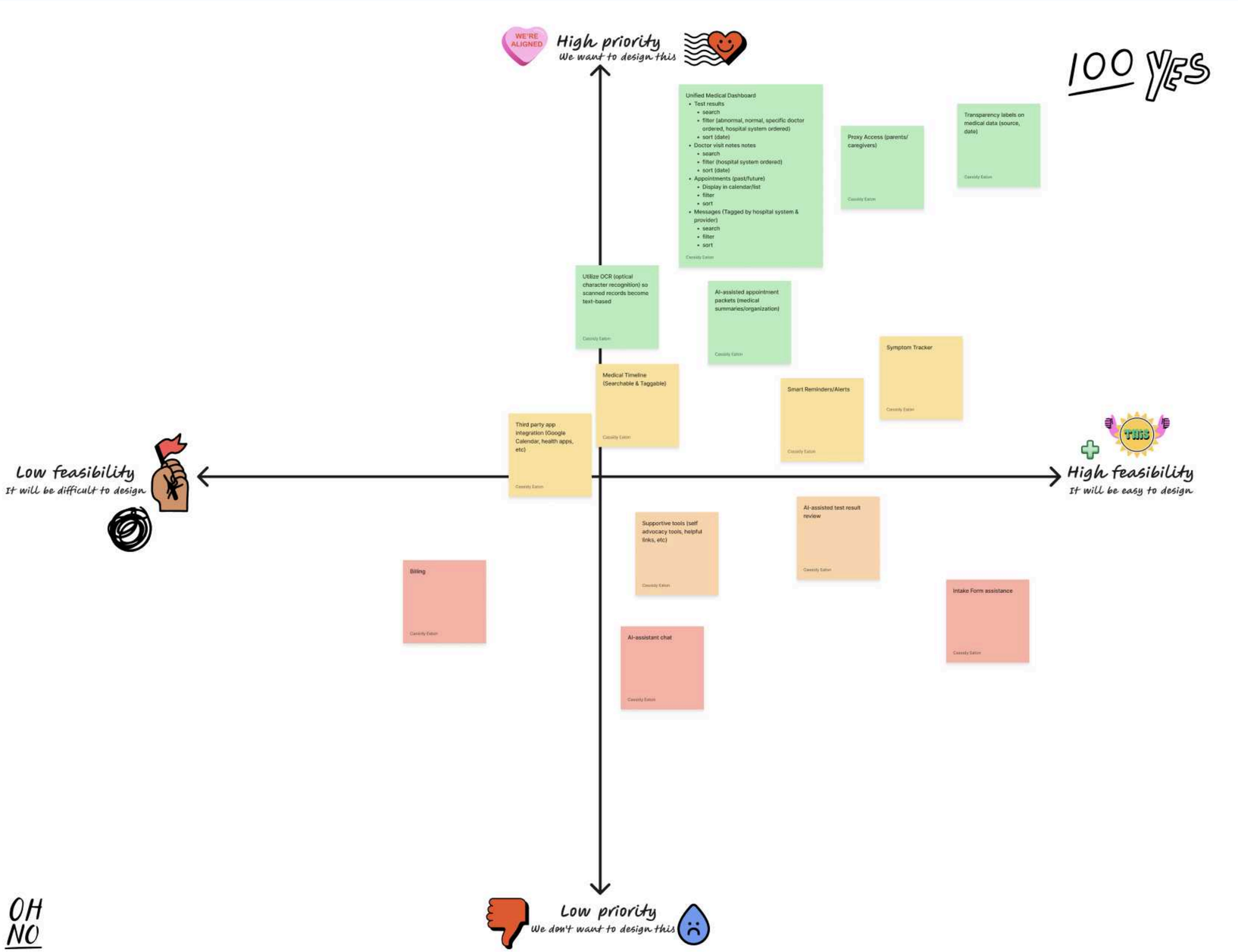
Why: Physicians want digital records that aren't just static images. They want data they can quickly search, copy, paste, and integrate into their workflow.
Idea:
- Utilize OCR (optical character recognition) so scanned records become text-based, searchable, and copy/paste friendly for providers.

Relevancy of Design Opportunities

Problem Statement

"The individuals who manage or receive care across multiple medical systems experience fragmented medical data, which leads to overwhelming stress, communication issues, and delays in care. Solving this problem will reduce the emotional burden on patients by helping them manage, track, and share their health information more easily. This is important because individuals can easily access medical data in a centralized and up-to-date location resulting in improved health outcomes."

Prioritization Matrix



Main Design Opportunities

Chronic Illness

- Unified Dashboard (test results, appointments, messages)
- Shareable data

Parents/Caregivers

- Proxy access
- Combined Calendars
- Combined Notifications

Physicians

- View relevant medical data from patient (test results, medications, previous doctor notes)
- See source of medical data for reliability

Journey Map: Chronic Illness Patient

Prepping for a specialist appointment

Current State

Maya (Chronic Illness Patient)

Customer Goals	To prepare thoroughly for a new neurology appointment by gathering relevant medical records, notes, and test results ahead of time.									
Stages	Awareness of upcoming appointment	Checking upcoming appointment information		Collecting relevant medical data		Collecting relevant personal data		Attending the appointment		
Activities	Receives appointment reminder text	Logs into new patient portal	Confirms time, location, and doctor	Logs into 3-5 different systems	Scrolls through test results and appointment notes to find the relevant ones	Organize symptom logs	Prepare appointment questions & goals	Check-in at front desk	Review medical history and symptoms with doctor	Discuss next steps with doctor
Features & Data	• Phone (text)	• Patient portal (e.g., MyChart) • Input correct username/password	• Patient portal (e.g., MyChart)	• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp) • Email	• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp)	• Phone notes app • Google docs • Symptom tracking app	• Phone notes app • Google docs	• Paper forms	• Physical medical documents • Virtual medical files • Phone notes app	• Phone notes app • Patient portal • After visit summary print out
Pain Point	• Doesn't automatically connect to personal calendars	• Has to remember multiple patient portals, which doctor is connected to each one, and the log in information	• Some patient portals have all the relevant information about an appointment and some don't	• Has to remember multiple patient portals, what test results/appointment notes/ messages are connected to each one, and the log in information	• Has to know what to look for (test result names, locations, etc)	• Important notes in various places	• Takes time • Need to think of good questions to ask	• Repetitive steps	• Medical information is in multiple locations	• Can be rushed • Easy to forget
Opportunities	• Smart alerts with appointment prep checklist	• Unified calendar that syncs all appointments across portals	• View full appointment context in one place	• One unified place to view medical data	• Search • Filters (abnormal, normal, specific doctor, hospital system, date) • Sort (Most Recent/Oldest) • AI-assistant to pull/organize relevant data for appointments	• One-click "Visit Packet" creation • Secure file sharing with provider before appointment • AI-generated patient summary and history	• One-click "Visit Packet" creation • AI-assistant for question/goal suggestions	• Compiled personal data of commonly asked questions on intake forms that users can fill out for reference later	• Transcribe appointment conversation (exact, summary, key takeaways, etc) • AI-assistant five question suggestions	• Picture/scan documents/notes into centralized location for appointment notes
Emotions	Nervous: "I forgot about this. I hope it goes well."	Confused: "What's my login?"	Worried: "I hope I can find the facility okay."	Overwhelmed: "Why isn't everything in one place?!"	Mentally fatigued: "This takes so much brainpower."	Insecure: "What if I miss something important?"	Tired: "I've been working on this for hours."	Annoyed: "I always have to fill out the same information over and over."	Mentally fatigued: "This takes so much brainpower."	Tired: "I still have other appointments this week."

Future State

Maya (Chronic Illness Patient)

Customer Goals	To prepare thoroughly for a new neurology appointment by gathering relevant medical records, notes, and test results ahead of time.							
Stages	Awareness of upcoming appointment	Checking upcoming appointment information		Collecting relevant medical/personal data	Share medical data	Attending the appointment		
Activities	Receives appointment reminder	Appointment reminder has Location, time, and doctor name information	Clicks link in calendar that opens united patient portal	Makes a patient packet with medical/personal data with the united patient portal	Saves as a pdf to send to doctor office & prints a personal copy	Check-in at front desk and references united patient portal	Review medical history and symptoms with doctor	Discuss next steps with doctor
Features & Data	• Google Calendar	• Google Calendar	• United patient portal	• United patient portal • AI assistant • Test results, scan results, appointment notes, symptoms, etc	• United patient portal • Doctor Office Fax Machine	• Paper forms • United patient portal	• Patient: Physical copy of patient packet from united patient portal • Doctor: Patient portal copy faxed to office	• United patient portal • After visit summary print out
Pain Point	-	-	-	-	-	-	-	-
Opportunities	• Location, time, and doctor name information • Appointment prep checklist	• Unified calendar that syncs all appointments across portals	• View full appointment context in one place	• Make the process easy by utilizing a step-by-step process	• Multiple ways to save & share	• Compiled personal data of commonly asked questions on intake forms that users can fill out for reference later	• Transcribe appointment conversation (exact, summary, key takeaways, etc) • AI-assistant five question suggestions	• Picture/scan documents/notes into centralized location for appointment notes
Emotions	Nervous: "I forgot about this. I hope it goes well."	Glad: "It's nice to have all the information available at a quick glance."	Thankful: "I'm so glad all the information is in one place."	Suprised: "Wow! That was so easy! It walked me through the process step by step and pulled from information already in the system."	Confident: "I faxed a copy to the office and I will have a physical version incase something goes wrong."	Relaxed: "I always have to fill out the same information over and over. But now I have all the information I need here in one place so it is much easier!"	Thankful: "My doctor was able to review the faxed medical packet I sent over so we had a great discussion!"	Confident: "I still have other appointments this week, but I feel much more confident and in control of my medical data!"

Journey Map: Chronic Illness Patient

Current State

Prepping for a specialist appointment

Current State

Maya (Chronic Illness Patient)

🥅 Customer Goals				
🚀 Stages	**Awareness of upcoming appointment**	**Checking upcoming appointment information**		
⚡ Activities	Receives appointment reminder text	Logs into new patient portal	Confirms time, location, and doctor	
🖼️ Features & Data	• Phone (text)	• Patient portal (e.g., MyChart) • Input correct username/password	• Patient portal (e.g., MyChart)	• Patien • Lab s • Email
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🤷‍♂️ Emotions	🙃 Nervous: "I forgot about this. I hope it goes well."	🤔 Confused: "What's my login?"	😓 Worried: "I hope I can find the facility okay."	

Journey Map: Chronic Illness Patient

Current State

Prepping for a specialist appointment

📖 Customer Goals	To prepare thoroughly for a new neurology appointment by gathering relevant medical records, notes, and test results ahead of time.				
🚀 Stages	Collecting relevant medical data		Collecting relevant personal data		
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⚡ Pain Point	• Has to remember multiple patient portals, what test results/appointment notes/ messages are connected to each one, and the log in information	• Has to know what to look for (test result names, locations, etc)	• Important notes in various places	• Takes time • Need to think of good questions to ask	
⚡ Opportunities	• One unified place to view medical data	• Search • Filters (abnormal, normal, specific doctor, hospital system, date) • Sort (Most Recent/Oldest) • AI-assistant to pull/organize relevant data for appointments	• One-click "Visit Packet" creation • Secure file sharing with provider before appointment • AI-generated patient summary and history	• One-click "Visit Packet" creation • AI-assistant for question/goal suggestions	
🤷 Emotions	😟 Overwhelmed: "Why isn't everything in one place?"	😓 Mentally fatigued: "This takes so much brainpower."	😬 Insecure: "What if I miss something important?"	🤦 Tired: "I've been working on this for hours."	

Journey Map: Chronic Illness Patient

Current State

Prepping for a specialist appointment

📖 Customer Goals			
🚀 Stages		**Attending the appointment**	
⚡ Activities		Check-in at front desk	Review medical history and symptoms with doctor	Discuss next steps with doctor
🗂️ Features & Data		• Paper forms	• Physical medical documents • Virtual medical files • Phone notes app	• Phone notes app • Patient portal • After visit summary print out
⚡ Pain Point		• Repetitive steps	• Medical information is in multiple locations	• Can be rushed • Easy to forget
⚡ Opportunities		• Compiled personal data of commonly asked questions on intake forms that users can fill out for reference later	• Transcribe appointment conversation (exact, summary, key takeaways, etc) • AI-assistant live question suggestions	• Picture/scan documents/notes into centralized location for appointment notes
🤷 Emotions		 Annoyed: "I always have to fill out the same information over and over."	 Mentally fatigued: "This takes so much brainpower."	 Tired: "I still have other appointments this week."

Journey Map: Chronic Illness Patient

Prepping for a specialist appointment

Future State

Future State

Maya (Chronic Illness Patient)

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🤷‍♂️ Emotions	🙃 Nervous: “I forgot about this. I hope it goes well.”	🙂 Glad: “It’s nice to have all the information available at a quick glance.”	🙂 Thankful: “I’m so glad all the information is in one place.”	🤩

Journey Map: Chronic Illness Patient

Future State

Prepping for a specialist appointment

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🚀 Stages		**Collecting relevant medical/personal data**	**Share medical data**	
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Journey Map: Chronic Illness Patient

Future State

Prepping for a specialist appointment

📖 Customer Goals	, notes, and test results ahead of time.		
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⚡ Activities		Check-in at front desk and references united patient portal	Review medical history and symptoms with doctor	Discuss next steps with doctor
🗂️ Features & Data		• Paper forms • United patient portal	• Patient: Physical copy of patient packet from united patient portal • Doctor: Patient portal copy faxed to office	• United patient portal • After visit summary print out
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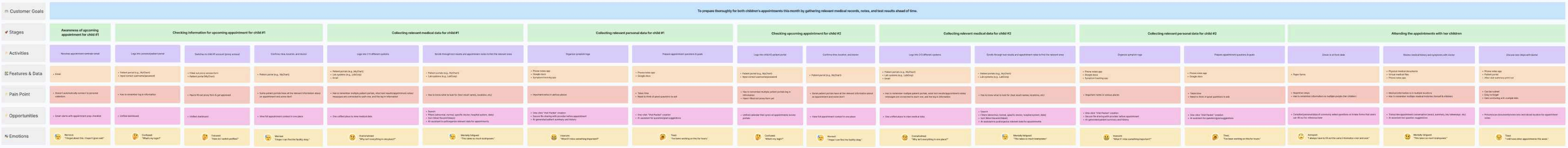
🤷 Emotions		😎 Relaxed: "I always have to fill out the same information over and over. But now I have all the information I need here in one place so it is much easier!"	😍 Thankful: "My doctor was able to review the faxed medical packet I sent over so we had a great discussion!"	🤩 Confident: "I still have other appointments this week, but I feel much more confident and in control of my medical data!"

Journey Map: Parent

Prepping for two children's appointments

Current State

Rachel (Caretaker/Mother)



Future State

Rachel (Caretaker/Mother)

Journey Map: Parent

Current State

Prepping for two children's appointments

Current State

Rachel (Caretaker/Mother)

📖 Customer Goals					
🚀 Stages	**Awareness of upcoming appointment for child #1**	**Checking information for upcoming appointment for child #1**			
⚡ Activities	Receives appointment reminder email	Logs into personal patient portal	Switches to child #1 account (proxy access)	Confirms time, location, and doctor	
🖼️ Features & Data	• Email	• Patient portal (e.g., MyChart) • Input correct username/password	• Filled out proxy access form • Patient portal (MyChart)	• Patient portal (e.g., MyChart)	• Patient portals • Lab systems (• Email
⚡ Pain Point	• Doesn't automatically connect to personal calendars	• Has to remember log in information	• Has to fill out proxy form & get approved	• Some patient portals have all the relevant information about an appointment and some don't	• Has to rememl messages are
⚡ Opportunities	• Smart alerts with appointment prep checklist	• Unified dashboard	• Unified dashboard	• View full appointment context in one place	• One unified pl
🤦 Emotions	😓 Nervous: "I forgot about this. I hope it goes well."	🤔 Confused: "What's my login?"	🤔 Focused: "How do I switch profiles?"	😓 Worried: "I hope I can find the facility okay."	

Journey Map: Parent

Current State

Prepping for two children's appointments

📖 Customer Goals	To prepare thoroughly for both c				
🚀 Stages		Collecting relevant medical data for child #1		Collecting relevant personal data for child #1	
⚡ Activities		Logs into 3-5 different systems	Scrolls through test results and appointment notes to find the relevant ones	Organize symptom logs	Prepare appointment questions & goals
🖼️ Features & Data		• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp) • Email	• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp)	• Phone notes app • Google docs • Symptom tracking app	• Phone notes app • Google docs
⚡ Pain Point	about	• Has to remember multiple patient portals, what test results/appointment notes/ messages are connected to each one, and the log in information	• Has to know what to look for (test result names, locations, etc)	• Important notes in various places	• Takes time • Need to think of good questions to ask
⚡ Opportunities		• One unified place to view medical data	• Search • Filters (abnormal, normal, specific doctor, hospital system, date) • Sort (Most Recent/Oldest) • AI-assistant to pull/organize relevant data for appointments	• One-click "Visit Packet" creation • Secure file sharing with provider before appointment • AI-generated patient summary and history	• One-click "Visit Packet" creation • AI-assistant for question/goal suggestions
🤦 Emotions		😟 Overwhelmed: "Why isn't everything in one place?"	😓 Mentally fatigued: "This takes so much brainpower."	😬 Insecure: "What if I miss something important?"	🥱 Tired: "I've been working on this for hours."

Journey Map: Parent

Current State

Prepping for two children's appointments

Customer Goals	ghly for both children's appointments this month by gathering relevant medical records, notes, and test results ahead of time.					
Stages	Checking upcoming appointment for child #2		Collecting relevant medical data for child #2		Collecting relevant personal data for child #2	
Activities	Logs into child #2 patient portal	Confirms time, location, and doctor	Logs into 3-5 different systems	Scrolls through test results and appointment notes to find the relevant ones	Organize symptom logs	Prepare appointment questions & goals
Features & Data	• Patient portal (e.g., MyChart) • Input correct username/password	• Patient portal (e.g., MyChart)	• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp) • Email	• Patient portals (e.g., MyChart) • Lab systems (e.g., LabCorp)	• Phone notes app • Google docs • Symptom tracking app	• Phone notes app • Google docs
Pain Point	• Has to remember multiple patient portals log in information • Hasn't filled out proxy form yet	• Some patient portals have all the relevant information about an appointment and some don't	• Has to remember multiple patient portals, what test results/appointment notes/ messages are connected to each one, and the log in information	• Has to know what to look for (test result names, locations, etc)	• Important notes in various places	• Takes time • Need to think of good questions to ask
Opportunities	• Unified calendar that syncs all appointments across portals	• View full appointment context in one place	• One unified place to view medical data	• Search • Filters (abnormal, normal, specific doctor, hospital system, date) • Sort (Most Recent/Oldest) • AI-assistant to pull/organize relevant data for appointments	• One-click "Visit Packet" creation • Secure file sharing with provider before appointment • AI-generated patient summary and history	• One-click "Visit Packet" creation • AI-assistant for question/goal suggestions
Emotions	Confused: "What's my login?"	Worried: "I hope I can find the facility okay."	Overwhelmed: "Why isn't everything in one place?"	Mentally fatigued: "This takes so much brainpower."	Insecure: "What if I miss something important?"	Tired: "I've been working on this for hours."

Journey Map: Parent

Current State

Prepping for two children's appointments

🥅 Customer Goals			
🚀 Stages	**Attending the appointments with her children**		
⚡ Activities	Check-in at front desk	Review medical history and symptoms with doctor	Discuss next steps with doctor
🖼️ Features & Data	• Paper forms	• Physical medical documents • Virtual medical files • Phone notes app	• Phone notes app • Patient portal • After visit summary print out
⚡ Pain Point	• Repetitive steps • Has to remember information on multiple people (her children)	• Medical information is in multiple locations • Has to remember multiple medical histories (herself & children)	• Can be rushed • Easy to forget • Gets confusing with multiple kids
⚡ Opportunities	• Compiled personal data of commonly asked questions on intake forms that users can fill out for reference later	• Transcribe appointment conversation (exact, summary, key takeaways, etc) • AI-assistant live question suggestions	• Picture/scan documents/notes into centralized location for appointment notes
🤷 Emotions	 Annoyed: "I always have to fill out the same information over and over."	 Mentally fatigued: "This takes so much brainpower."	 Tired: "I still have other appointments this week."

Journey Map: Parent

Future State

Prepping for two children's appointments

Future State

Rachel (Caretaker/Mother)

📖 Customer Goals					
🚀 Stages	**Awareness of upcoming appointment**	**Checking upcoming appointment information**		**Checking families appointments for the month**	
⚡ Activities	Receives appointment reminder	Appointment reminder has Location, time, and doctor name information	Clicks link in google alendar that opens united patient portal	Toggles calendar in united patient portal to "family view"	Looks at families appointments for the month
🖼️ Features & Data	• Google Calendar	• Google Calendar	• United patient portal	• United patient portal • Calendar	• United patient portal • Calendar
⚡ Pain Point	•	•	•	•	•
⚡ Opportunities	• Location, time, and doctor name information • Appointment prep checklist	• Unified calendar that syncs all appointments across portls	• View full appointment context in one place	• Offer different calendar views - personal or "family" (proxy access)	• Color-coding for each person so it is easy to see which appointments are for who
🤷 Emotions	🙃 Nervous: "I forgot about this. I hope it goes well."	🙂 Glad: "It's nice to have all the information available at a quick glance."	🙂 Thankful: "I'm so glad all the information is in one place."	🙂 Thankful: "I'm so glad all the information is in one place."	🙂 Thankful: "I'm so glad all the information is in one place."

Journey Map: Parent

Future State

Prepping for two children's appointments

Customer Goals	To prepare thoroughly for both children's appointments this month by gathering relevant medical recor			
Stages		Collecting relevant medical/personal data for child #1	Share medical data for child #1	
Activities		Switches profile to proxy view for child #1	Makes a patient packet with medical/personal data with the united patient portal	Saves as a pdf to send to doctor office & prints a personal copy	
Features & Data		• United patient portal • Proxy access • Profile switch	• United patient portal • AI assistant • Test results, scan results, appointment notes, symptoms, etc	• United patient portal • Doctor Office Fax Machine	• Unite • Proxy • Profil
Pain Point		•	•	•	•
Opportunities	ch	• Easy & clear profile switching	• Make the process easy by utilizing a step-by-step process	• Multiple ways to save & share	• Easy
Emotions	ce."	Thankful: "I'm so glad all the information is in one place."	Suprised: "Wow! That was so easy! It walked me through the process step by step and pulled from information already in the system."	Confident: "I faxed a copy to the office and I will have a physical version incase something goes wrong."	

Journey Map: Parent

Future State

Prepping for two children's appointments

Customer Goals	ant medical records, notes, and test results ahead of time.			
Stages		Collecting relevant medical/personal data for child #2	Share medical data for child #2	
Activities		Switches profile to proxy view for child #2	Makes a patient packet with medical/personal data with the united patient portal	Saves as a pdf to send to doctor office & prints a personal copy	
Features & Data		• United patient portal • Proxy access • Profile switch	• United patient portal • AI assistant • Test results, scan results, appointment notes, symptoms, etc	• United patient portal • Doctor Office Fax Machine	• Pa • Un
Pain Point		•	•	•	•
Opportunities		• Easy & clear profile switching	• Make the process easy by utilizing a step-by-step process	• Multiple ways to save & share	• Co ca
Emotions		Thankful: "I'm so glad all the information is in one place."	Suprised: "Wow! That was so easy! It walked me through the process step by step and pulled from information already in the system."	Confident: "I faxed a copy to the office and I will have a physical version incase something goes wrong."	

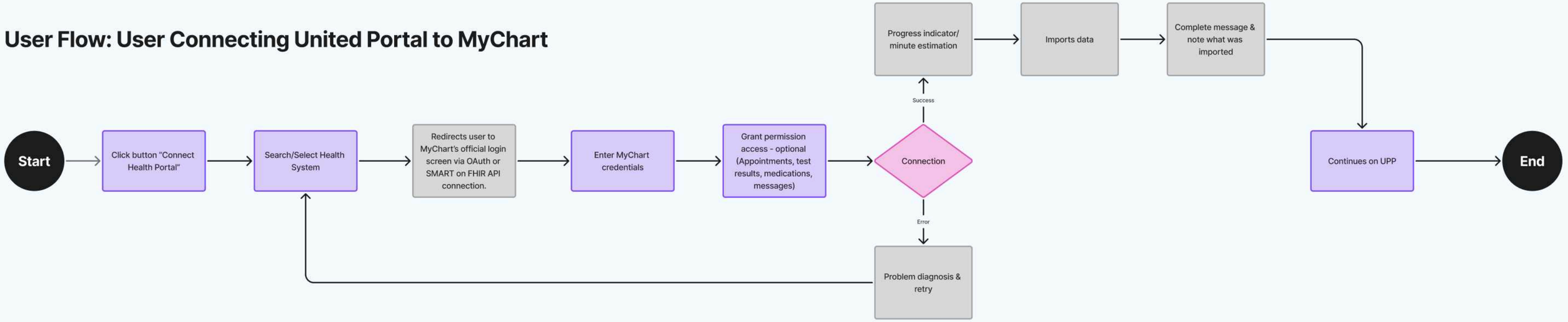
Journey Map: Parent

Future State

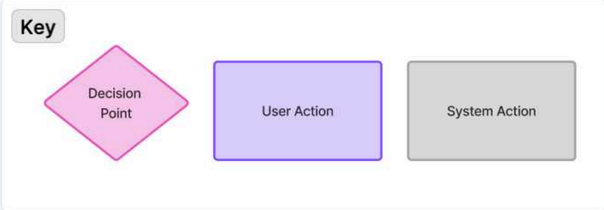
Prepping for two children's appointments

Customer Goals			
Stages	**Attending the appointments with her children**		
Activities	Check-in at front desk and references united patient portal	Review medical history and symptoms with doctor	Discuss next steps with doctor
Features & Data	• Paper forms • United patient portal	• Patient: Physical copy of patient packet from united patient portal • Doctor: Patient portal copy faxed to office	• United patient portal • After visit summary print out
Pain Point	•	•	•
Opportunities	• Compiled personal data of commonly asked questions on intake forms that users can fill out for reference later	• Transcribe appointment conversation (exact, summary, key takeaways, etc) • AI-assistant live question suggestions	• Picture/scan documents/notes into centralized location for appointment notes
Emotions	Relaxed: "I always have to fill out the same information over and over. But now I have all the information I need here in one place so it is much easier!"	Thankful: "My doctor was able to review the faxed medical packet I sent over so we had a great discussion!"	Confident: "I still have other appointments this week, but I feel much more confident and in control of my medical data!"

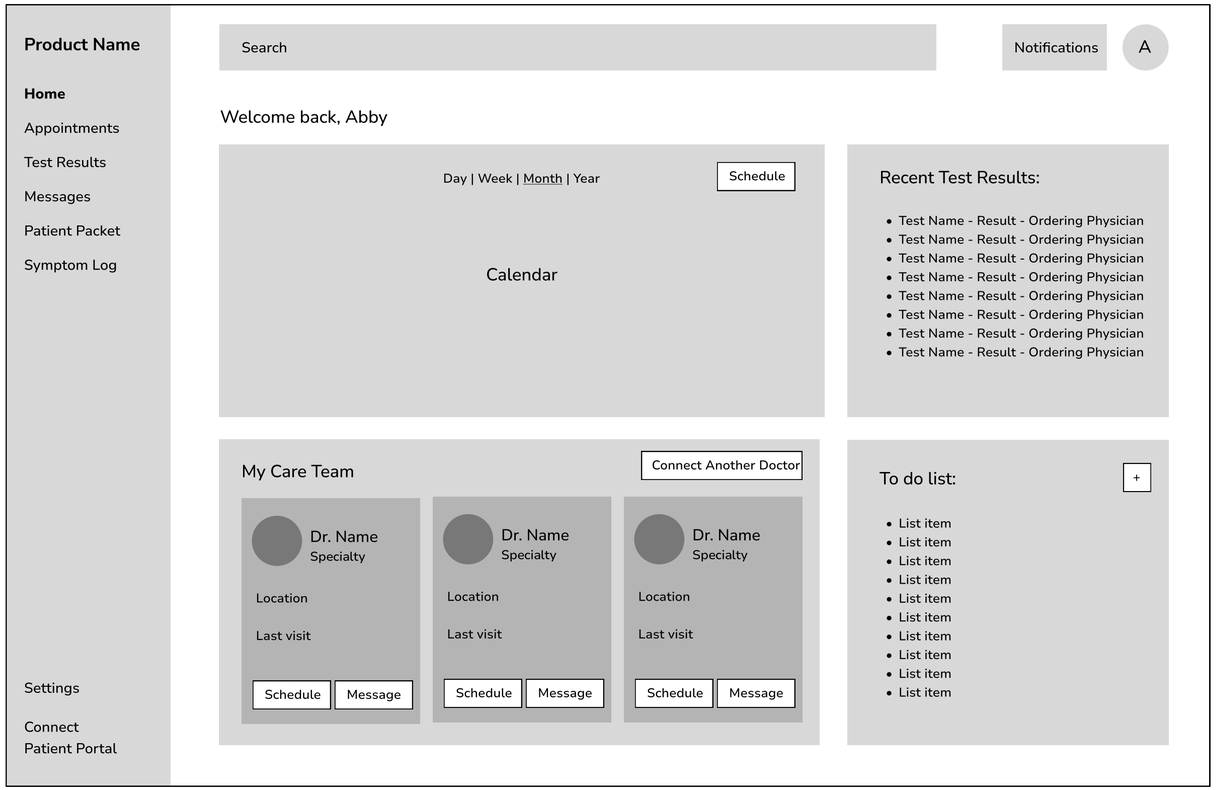
User Flow: User Connecting United Portal to MyChart



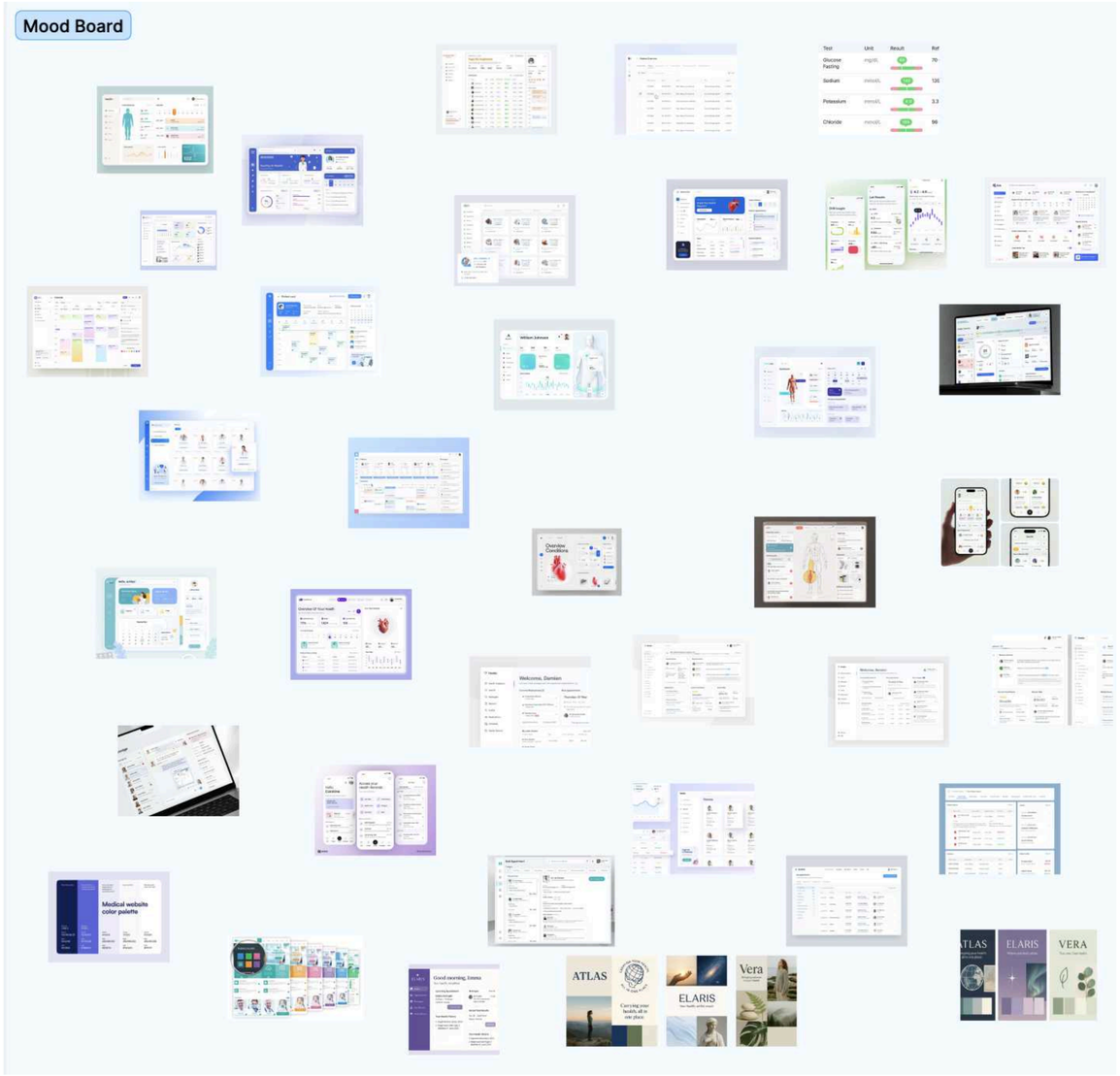
User Flow: User Creating Patient Packet



Wireframes (lo-fi)



Mood Board



Branding

Product Name Ideas:

Atlas Carries the world on his shoulders; implies holding and organizing everything.	**Aster** A star-shaped flower; elegant, soft, and hopeful.	**Vera** Latin for "true"; implies trust and accuracy.	**Prismara** (invented) – "Prism" + "ara" (Latin for altar); suggests refracted light and insight.	**Northstar** Navigational metaphor; a trusted guide through confusion.	**Noor** (Arabic for "light") – Short, beautiful, and means illumination.
Prism Breaks complex information into a spectrum you can understand.	**Ena** (Greek for "one") – Soft and feminine tone; evokes simplicity	**Emberlight** Warmth and subtle glow.	**Juniper** Evergreen shrub symbolizing protection and cleansing.	**Salus** Roman goddess of health and well-being.	**Elaris** Invented, airy, blends Elara + Iris tones.
Elara (ih-LAH-ruh) – A moon of Jupiter and name from Greek mythology.	**Eira** (AY-rah or EYE-rah) – Old Norse for "healing" or "snow."	**Veya** (VAY-uh) – Invented, airy and mystical; sounds like a guiding name.	**Vesper** Latin for "evening star"; feels quietly powerful.		

Thoughts:

- Clean
- Simple
- Utilizes color purposefully
- Color-coding options (calendar appointments)
- Trustworthy
- Caring
- Complex data made simple
  - Progressive Disclosure

Naming

"Patient Packet"

Option 1: Care Summary
- Tone: Warm, collaborative, patient-centered
- Strengths:
  - Feels like it's about ongoing care, not just raw data
  - Evokes a summary for a visit or treatment journey
  - Recognizable to providers (e.g., "continuity of care document")
- Potential Drawback: Slightly less clinical sounding — could feel broader

Example: "Generate your Care Summary to bring to your next appointment — a clear, organized view of what matters most."

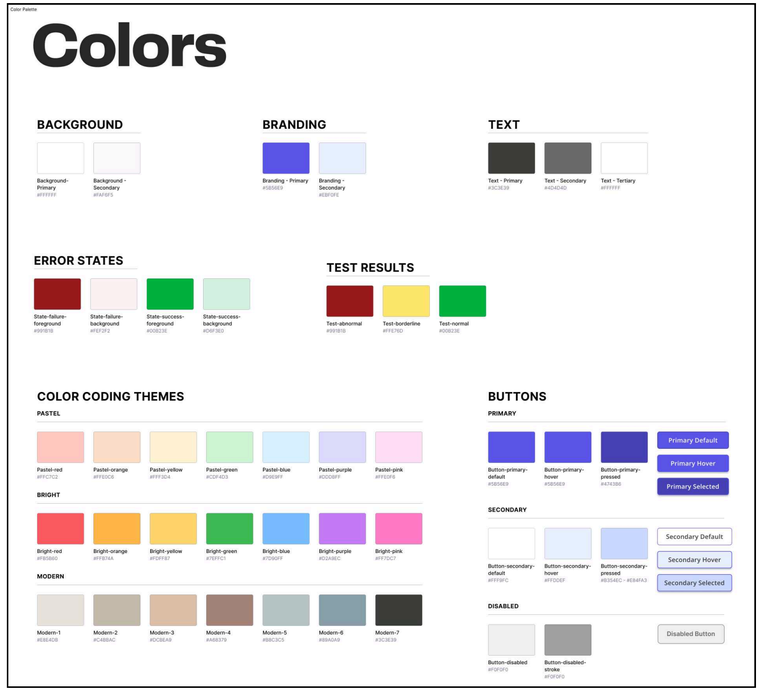
Option 2: Medical Summary
- Tone: Clinical, formal, data-driven
- Strengths:
  - Sounds very official — providers will instantly understand
  - Broad enough to include labs, notes, diagnoses, etc.
- Potential Drawback: Could sound less approachable to patients who are overwhelmed by medical systems

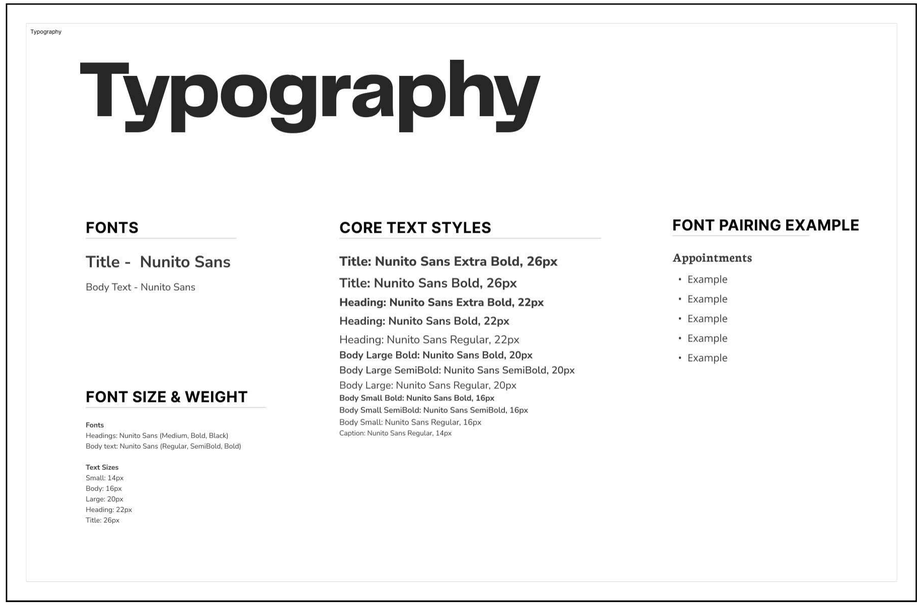
Example: "Your Medical Summary includes your most recent test results, medication history, and doctor notes — all in one shareable file."

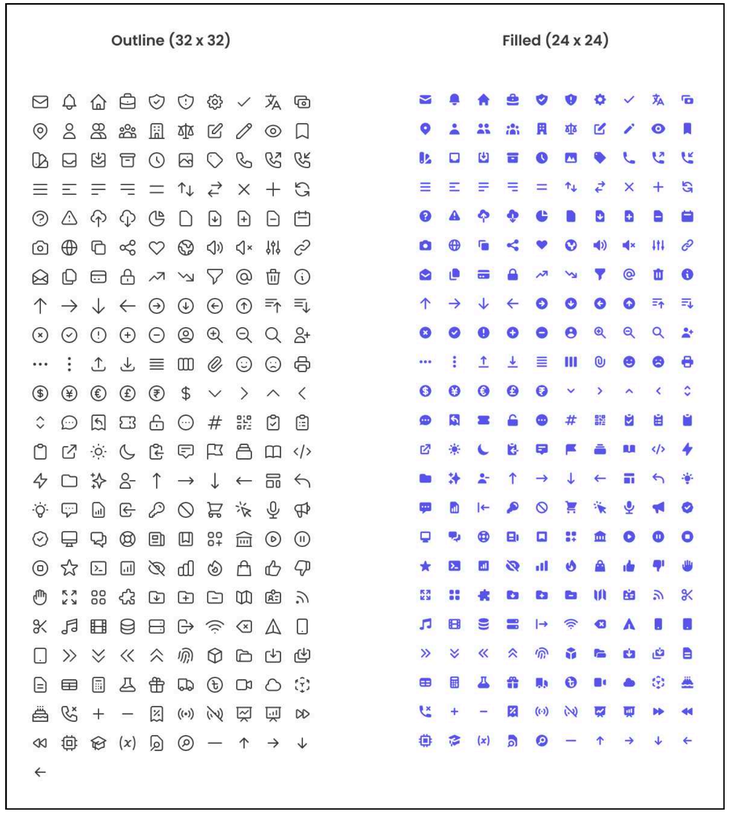
⭐ **Option 3: Health Summary**
- Tone: Balanced, approachable, comprehensive
- Strengths:
  - Broader than "medical" — includes wellness, symptoms, trends
  - Sounds accessible and not intimidating
  - Still clear enough for provider use
- Potential Drawback: Slightly vaguer for clinical settings

Example: "Easily generate your Health Summary with trends, test results, and your most important history — ready for any appointment."

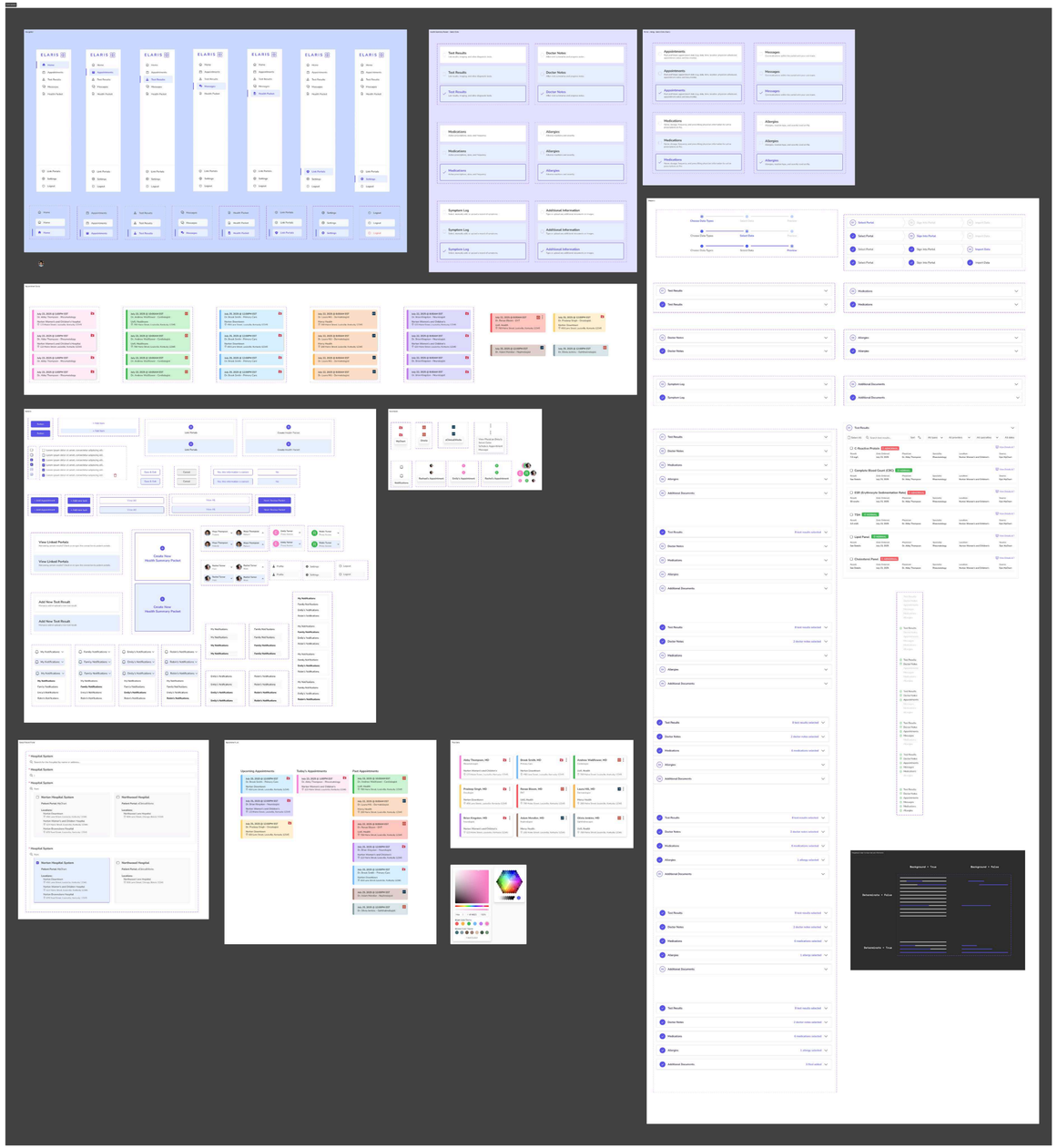
Design System



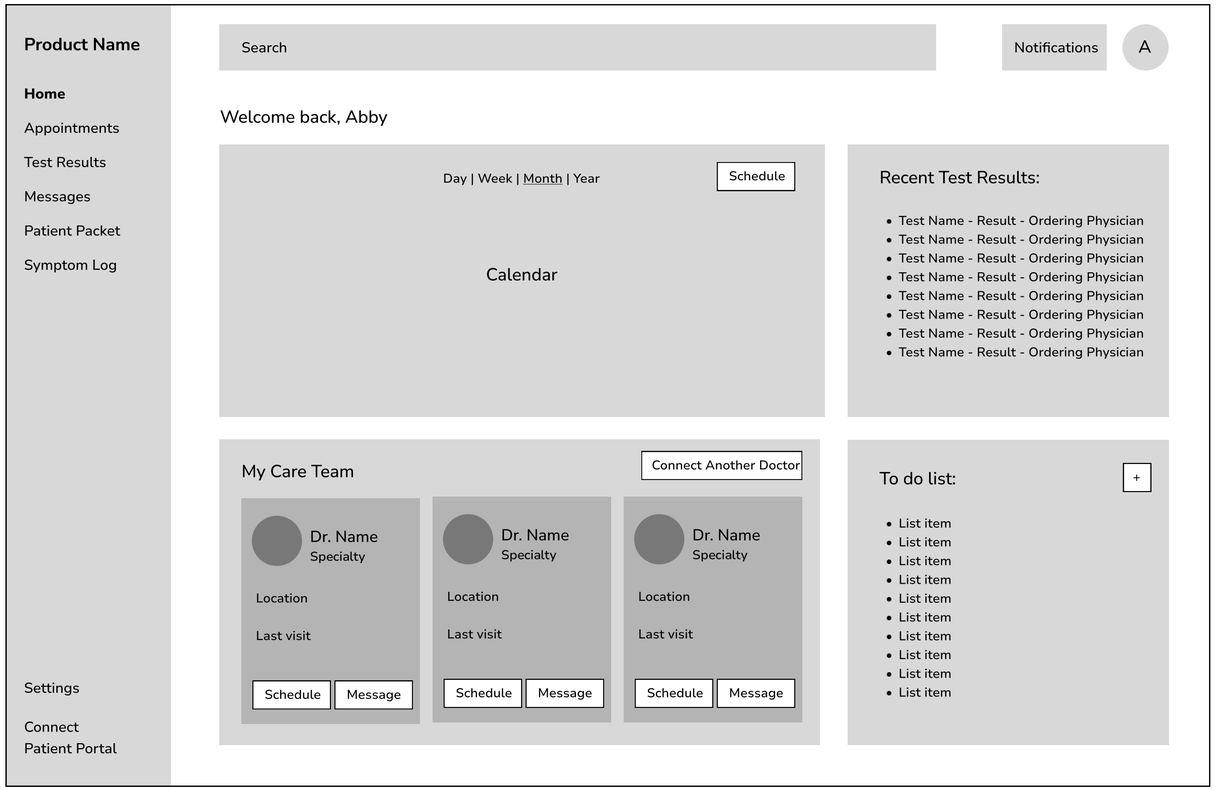




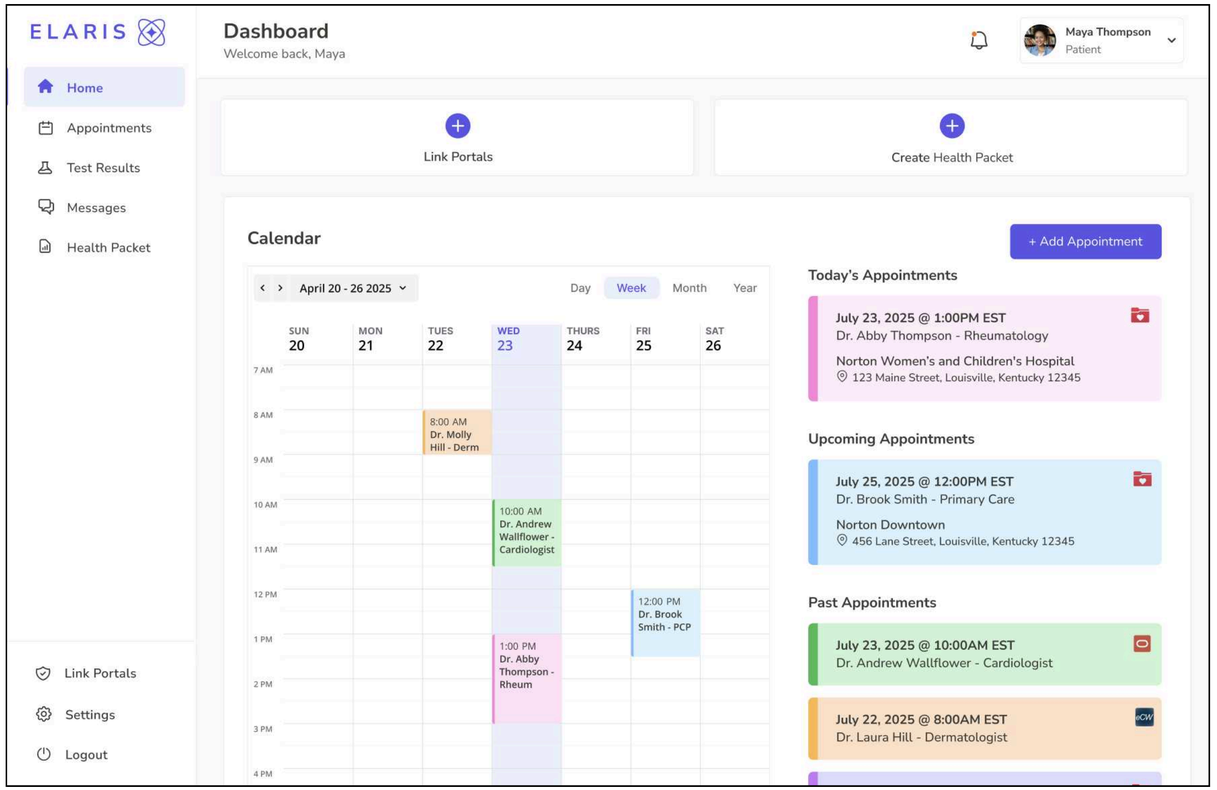
Figma Components



Wireframes (lo-fi)



Prototype



Usability Testing

Purpose: To understand how well users can navigate the prototype and complete the process of adding a patient portal, creating a health summary packet, and proxy access.

Method:

- Moderated over Zoom
- 45 minutes
- Prototype in Figma

Participants:

- 5 users of varying experience levels

Participant	Reason
1	Recently was in an accident and had to manage multiple doctors and portals.
2	No experience managing multiple doctors and portals.
3	Chronic illness patient with lots of experience in medical portals.
4	Parent of a child with chronic illness managing multiple doctors and portals.
5	Chronic illness patient with multiple conditions and deals with many portals and doctors.

Task Success Rate

The percentage of users who successfully complete a defined task during a usability study.

Key:

1 = Success (completed independently, correctly, and confidently)

0.5 = Partial Success (completed, but with hints, errors, or uncertainty)

0 = Failure (unable to complete or abandoned)

Task Number	Task	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	TSR	Notes
1	Add another medical portal	1	1	1	1	1	100%	All users completed successfully. P2 noted a minor pause when redirected to login because they didn't notice the button text telling them that would happen.
2	Create a patient packet	0.5	0.5	1	0.5	1	70%	P1 + P2 + P4 didn't notice dropdowns initially; some confusion around terminology. Generally completed with little hesittion.
3	Switch to childs account	1	1	1	1	1	100%	All users completed task easily. Though when explored more, P1 + P2 unsure of "proxy" term. P3, P4, P5 fully understood proxy meaning.
4	View notifications	1	1	1	1	1	100%	All users navigated to notifications easily.
5	Switch notification proxy views	1	1	1	1	1	100%	All found bell icon and could switch views. Appreciated color coding.
6	Switch calendar proxy views	1	1	1	1	1	100%	All successfully switched between personal/family views. Appreciated color coding and hover states.
	Overall Success Rate						95%	

System Usability Scale (SUS)

A 10-item questionnaire that measures a user's subjective perception of a system's usability after they have used it

Key:				
5 - strongly agree	4 - agree	3 - neutral	2 - disagree	1 - strongly disagree

Question Number	System Usability Scale (SUS) Question	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Average
1	I think that I would like to use this system frequently.	5	5	5	5	5	
2	I found the system unnecessarily complex.	1	1	1	1	1	
3	I thought the system was easy to use.	5	5	5	5	5	
4	I think that I would need the support of a technical person to be able to use this system.	1	5	1	1	1	
5	I found the various functions in this system were well integrated.	5	5	5	5	5	
6	I thought there was too much inconsistency in this system.	1	1	1	1	1	
7	I would imagine that most people would learn to use this system very quickly.	5	5	5	5	5	
8	I found the system very cumbersome to use.	1	1	1	1	1	
9	I felt very confident using the system.	5	4	5	5	5	
10	I needed to learn a lot of things before I could get going with this system.	4	5	1	1	1	
	SUS Score	**92.5**	**77.5**	**100**	**100**	**100**	**94**

Usability Testing Results

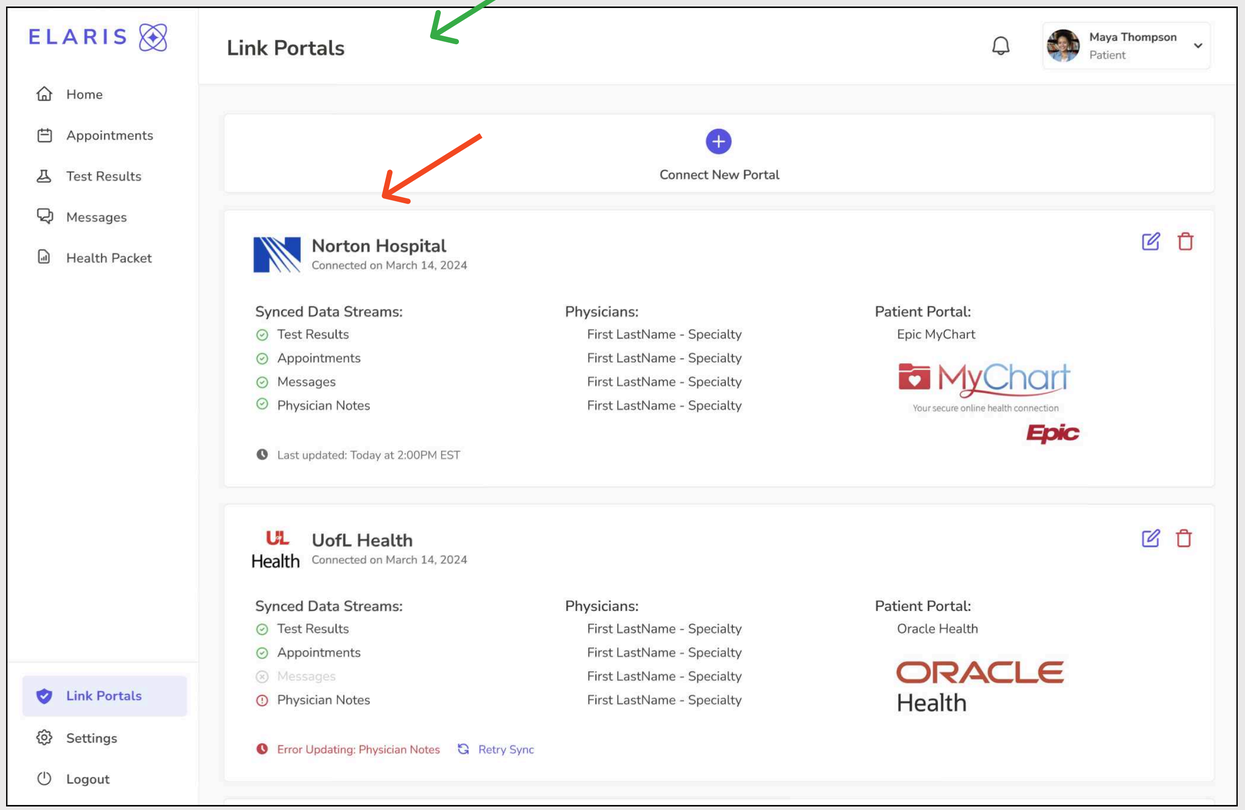
Biggest Strengths:

- Dashboard: clear, organized, color-coded.
- Portal linking: step-by-step, humanized, universally praised.
- Health packet: empowering, supports self-advocacy.
- Proxy access: intuitive location, parents liked family view.
- Notifications/Calendar: color coding and consistency reinforced confidence.

Primary Pain Points:

- Clearly display list of portals are connected.
- Dropdown arrows missed.
- Redirecting to portal login not always noticed.
- Packet preview was not obviously scrollable.
- Terminology: “Health Packet” and “Proxy Access” was new for some users.

Before



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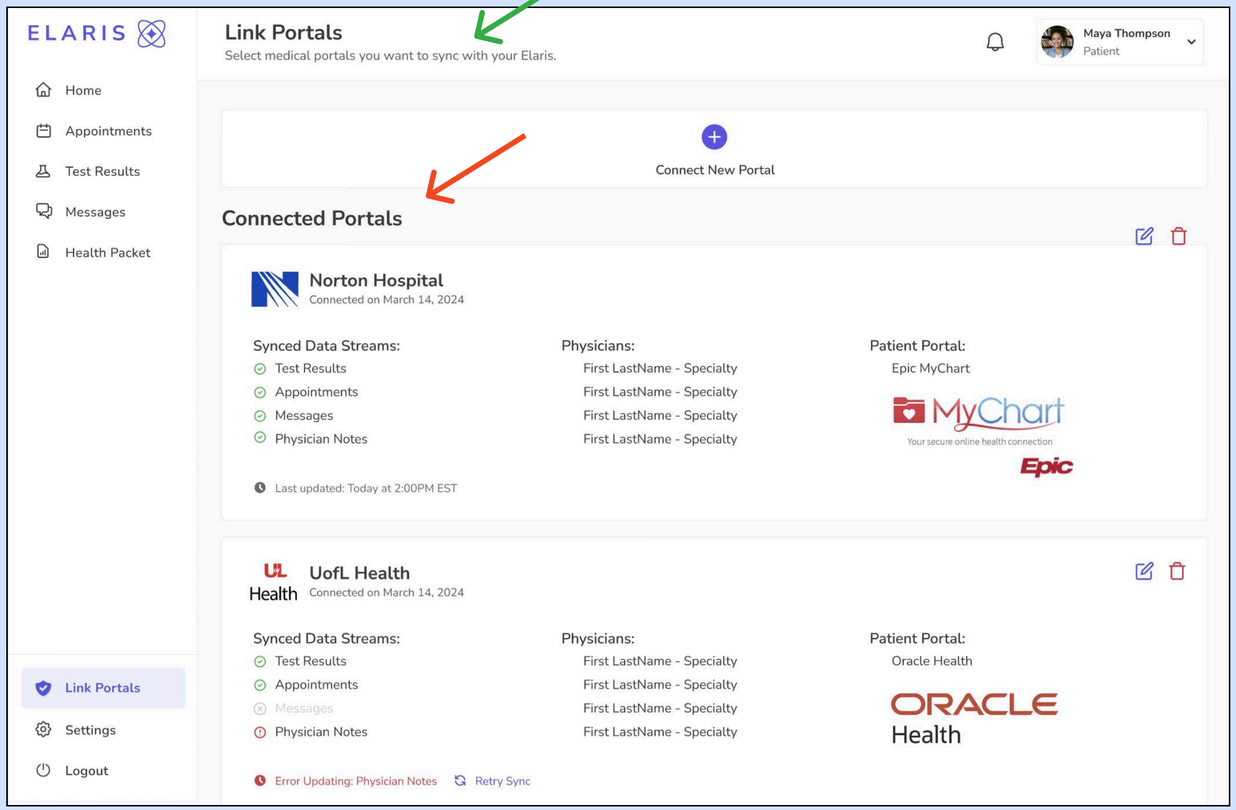

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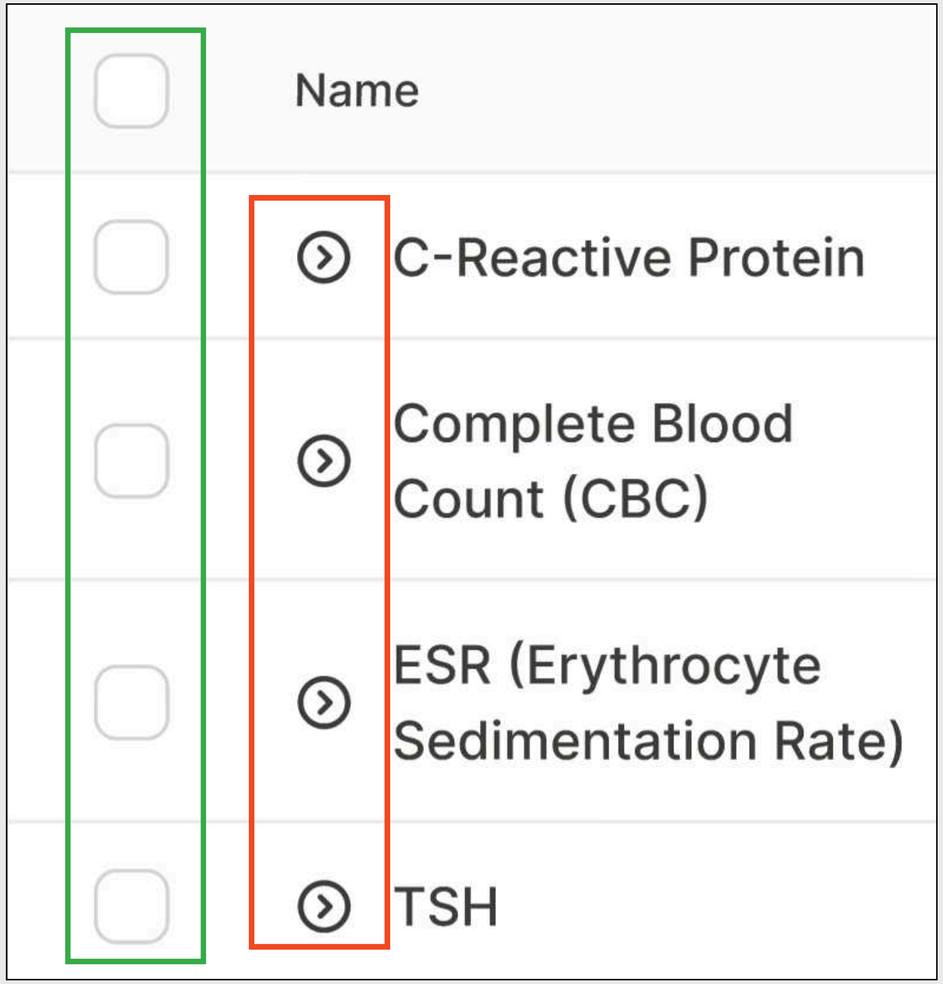

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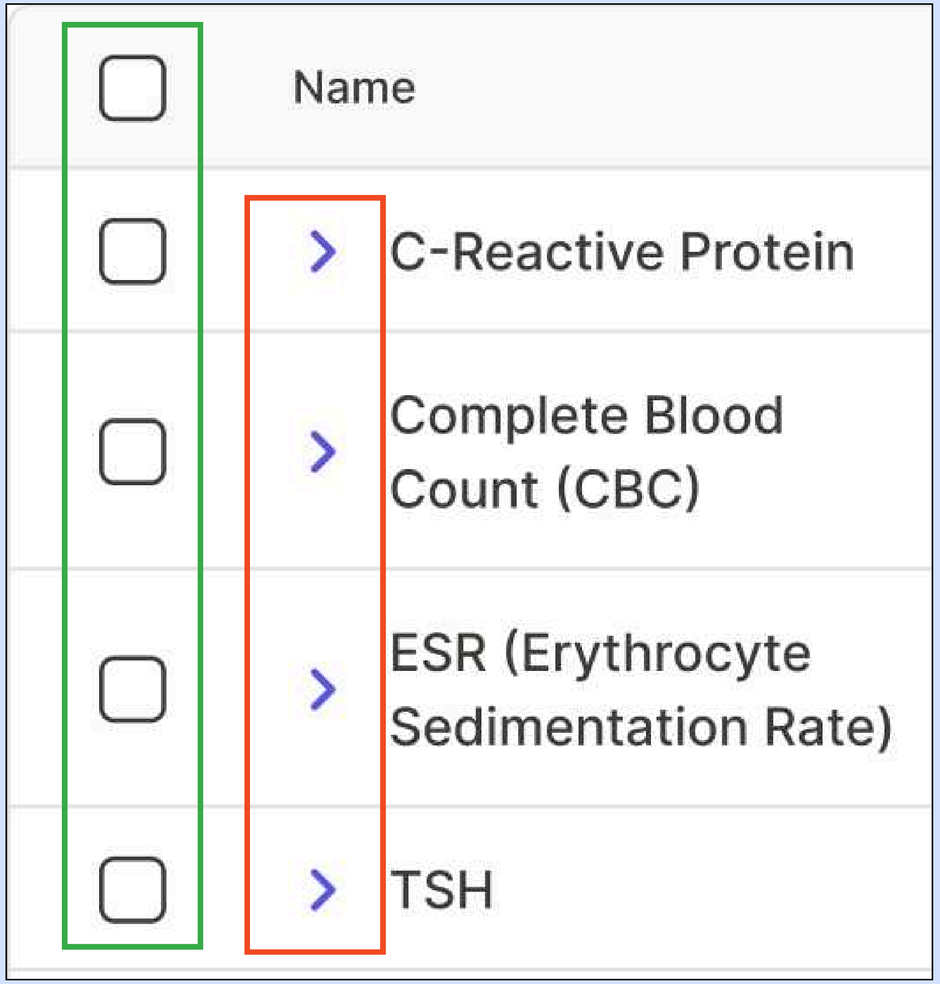


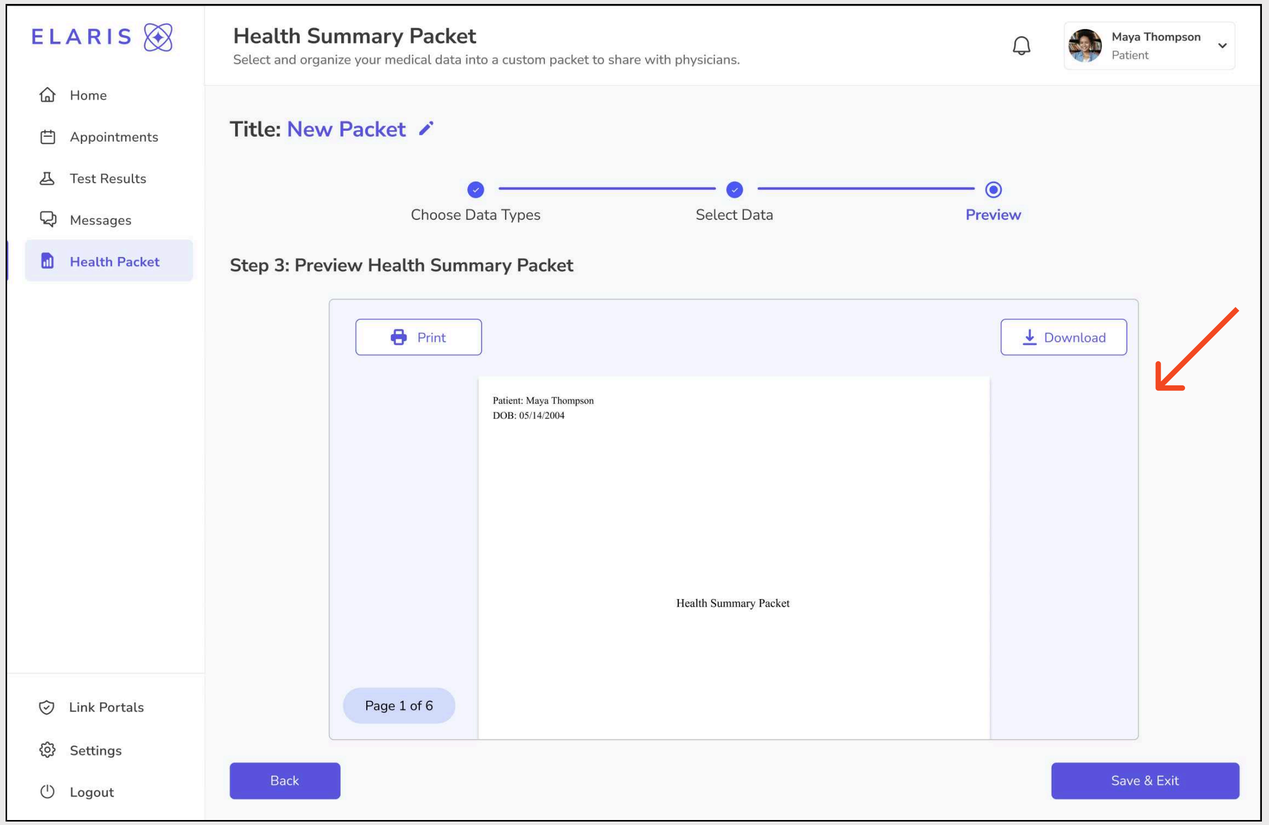
Before

Name	Status	Result
C-Reactive Protein	Abn	15.0 mg/L
	Abn	13.0 mg/L
	Abn	10.0 mg/L
	Nor	7.0 mg/L
	Abn	12.0 mg/L
	Abn	10.0 mg/L
Complete Blood Count (CBC)	Normal	See Details
ESR (Erythrocyte Sedimentation Rate)	Abnormal	50 mm/hr
TSH	Normal	3.0 mU/L
Lipid Panel	Normal	See Details
Cholesterol Panel	Abnormal	See Details
Chest X-Ray	Normal	See Details
Sodium	Normal	135 mEq/L
IGg	Normal	1,000 mg/dL
Estimated Glomerular Filtration Rate (eGFR)	Abnormal	35
Creatinine	Abnormal	1.5 mg/dL
Blood Urea Nitrogen (BUN)	Abnormal	25 mg/dL

After

Name	Status	Result
C-Reactive Protein	Abn	15.0 mg/L
	Abn	13.0 mg/L
	Abn	10.0 mg/L
	Nor	7.0 mg/L
	Abn	12.0 mg/L
	Abn	10.0 mg/L
Complete Blood Count (CBC)	Normal	See Details
ESR (Erythrocyte Sedimentation Rate)	Abnormal	50 mm/hr
TSH	Normal	3.0 mU/L
Lipid Panel	Normal	See Details
Cholesterol Panel	Abnormal	See Details
Chest X-Ray	Normal	See Details
Sodium	Normal	135 mEq/L
IGg	Normal	1,000 mg/dL
Estimated Glomerular Filtration Rate (eGFR)	Abnormal	35
Creatinine	Abnormal	1.5 mg/dL
Blood Urea Nitrogen (BUN)	Abnormal	25 mg/dL

Before



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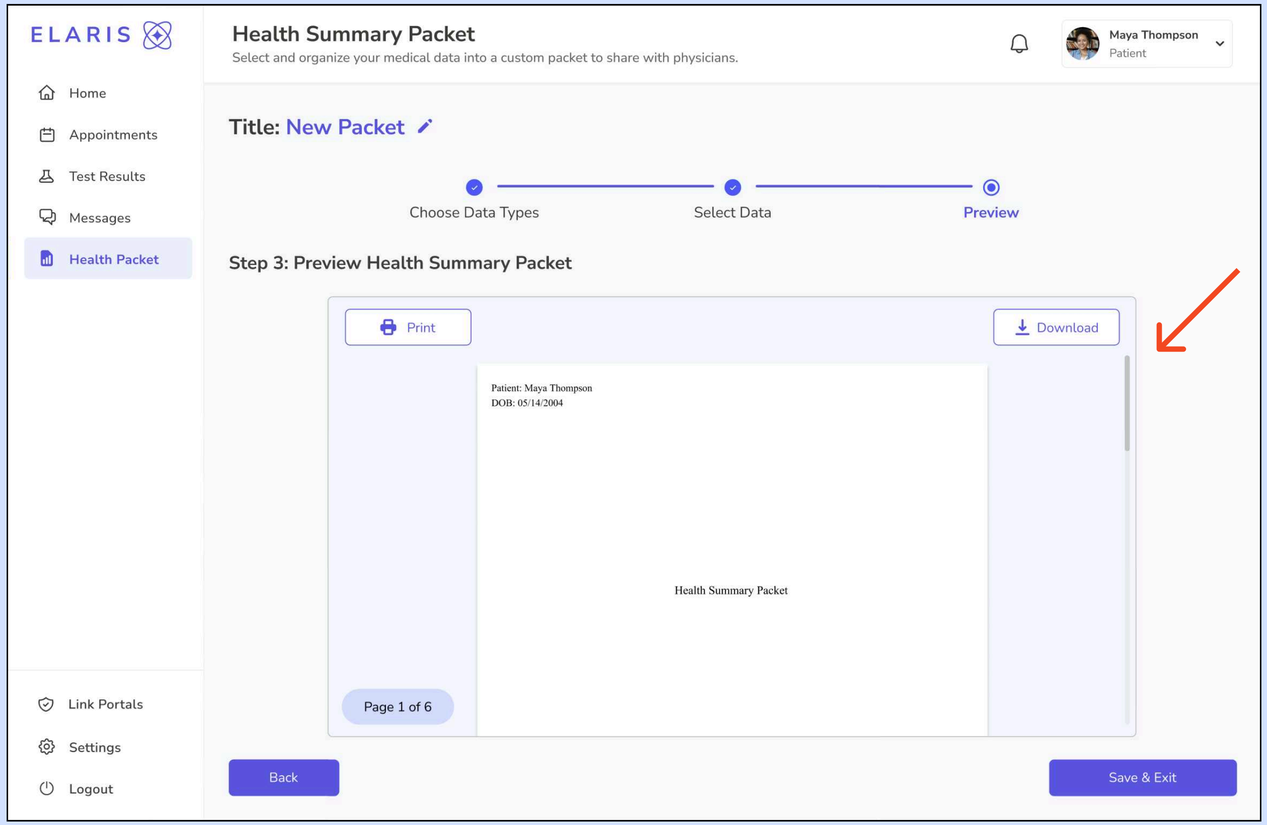

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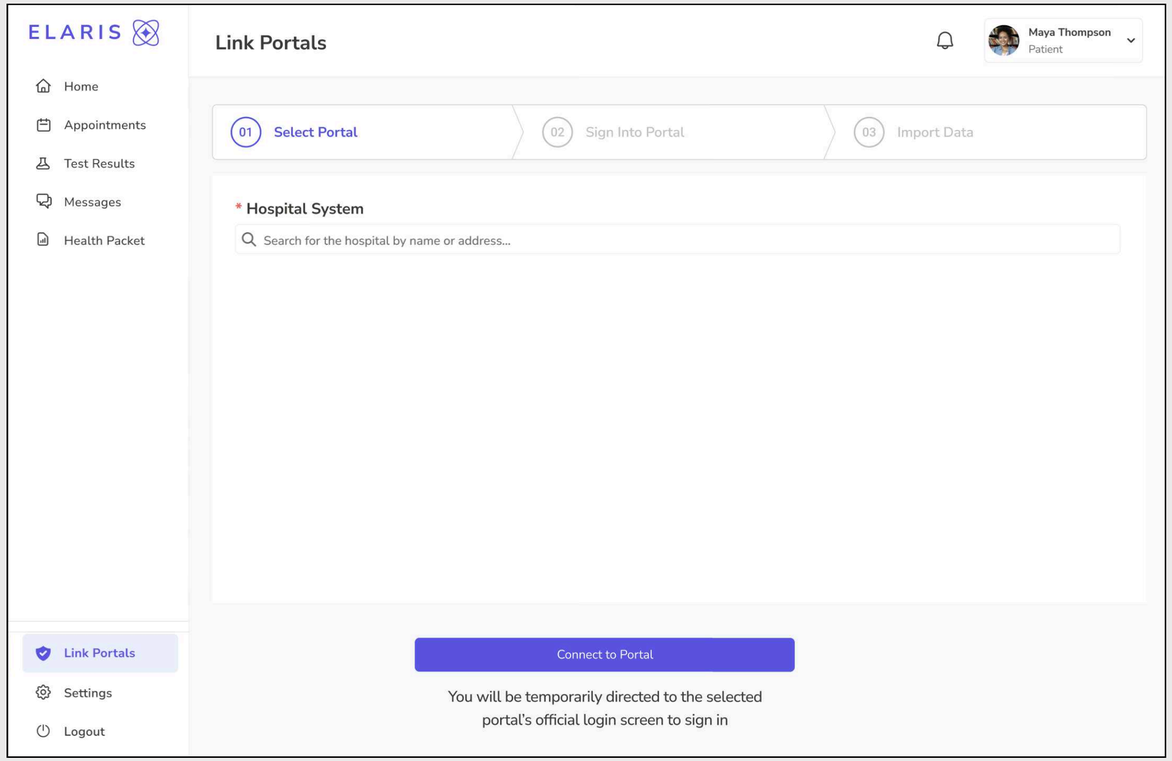

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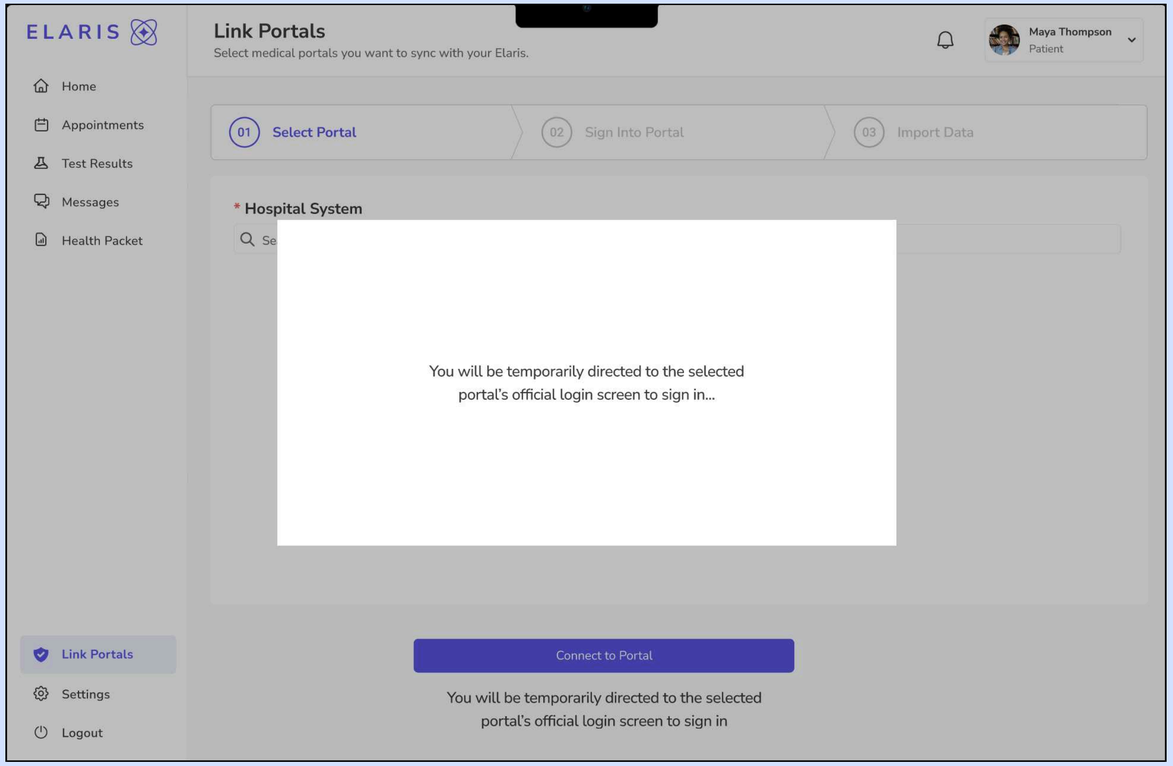

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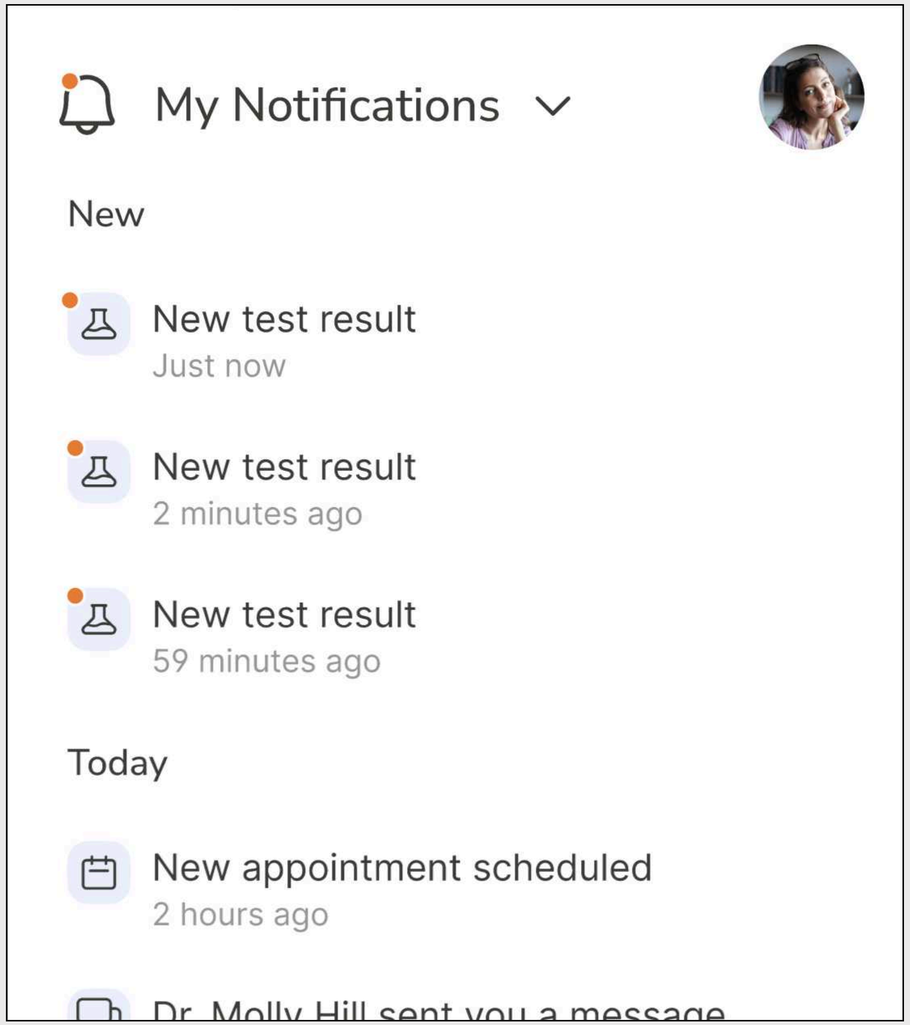

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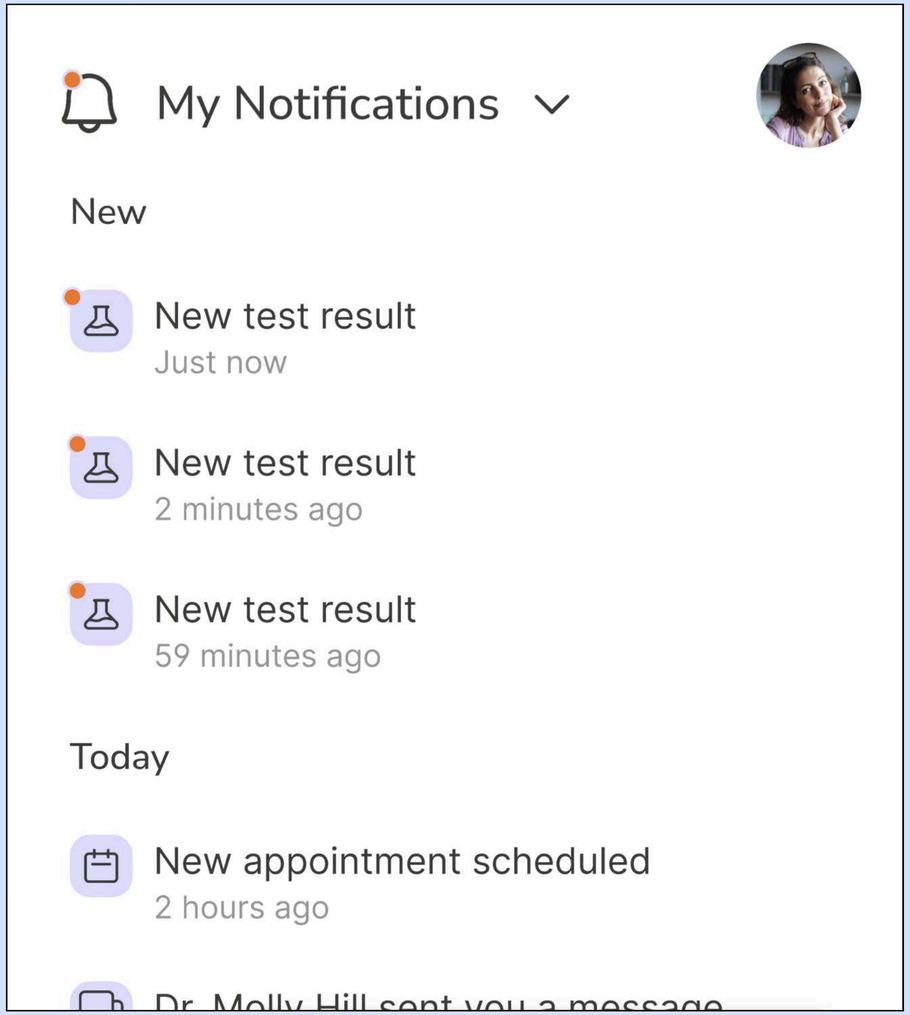
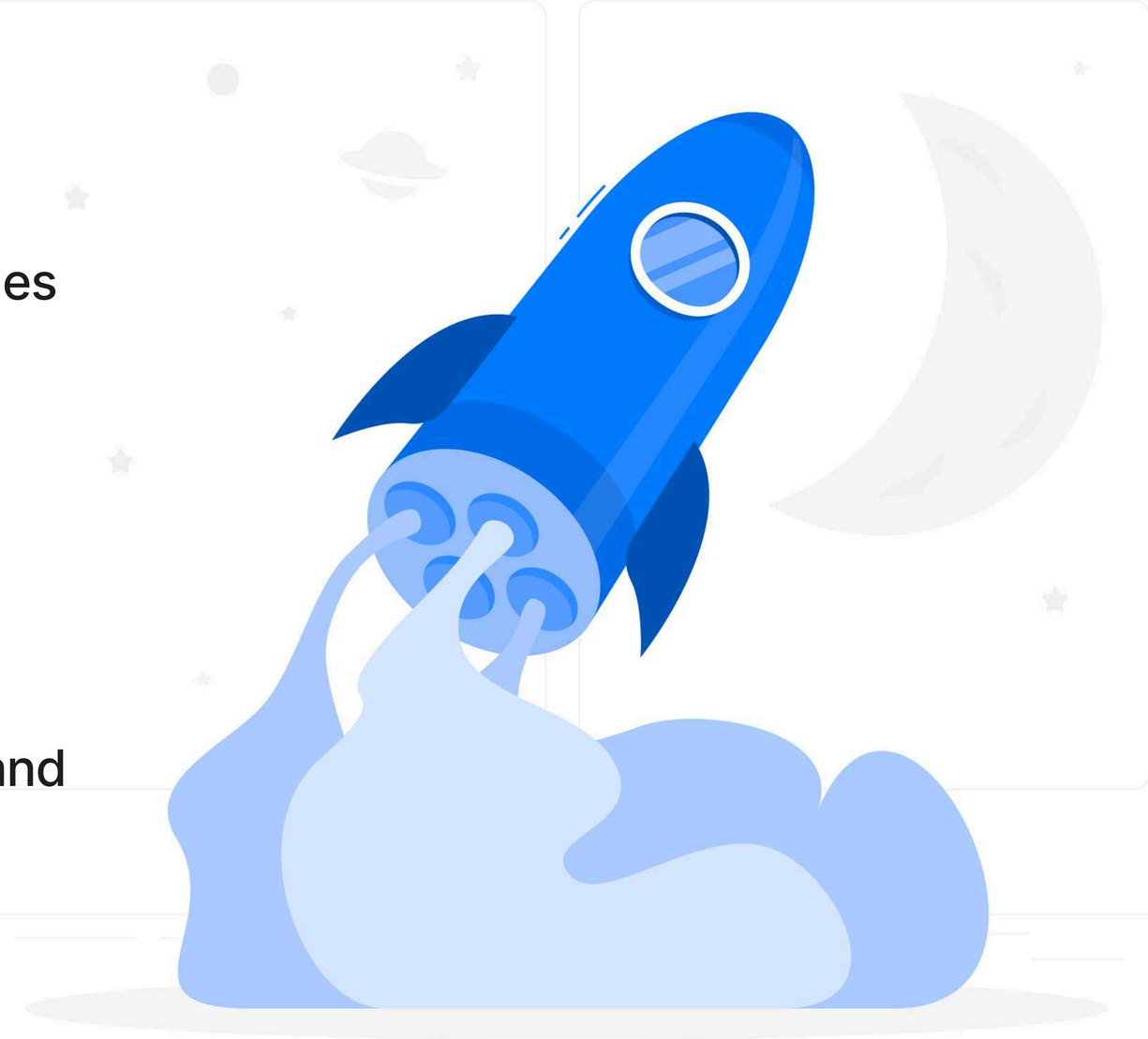


Final Prototype

https://www.loom.com/share/9e00668178ea49b6b15d69f338268cb7?sid=1bc99ef1-9efd-43df-b69c-c24ff0c8cf72

Next Steps

- Design an onboarding introduction
- Continue prototyping more of the pages
- More usability testing



Reflections

- Taking the proper steps for planning and research is so helpful
- Be open to changing your plans

Thank You

Solving Health Data Fragmentation for Patients

Cassidy Eaton

Appendix

Links:

- Tracker: https://docs.google.com/spreadsheets/d/1baPZqThtTSf4HBIh95vbOmkohr0IKi9XHHtrBgEEOQo/edit?usp=sharing
- FigJam: https://www.figma.com/board/BejW1dC2u2KugZg2uWZ5Qb/Capstone-2?node-id=0-1&t=0Vcbg5GOL4Wm39zU-1
- Figma: https://www.figma.com/design/j2QicNmTDAyc9IPbZcpswQ/Capstone-Project?node-id=12-834&t=tux5RKUH9b0YBNhE-1
- Prototype: https://www.figma.com/proto/j2QicNmTDAyc9IPbZcpswQ/Capstone-Project?node-id=34-6273&p=f&t=34NKE0PR6EkPJj2l-1&scaling=scale-down&content-scaling=fixed&page-id=12%3A834&starting-point-node-id=34%3A6273&show-proto-sidebar=1

Additional Slides:

- Desk Research
- Competitive Analysis
- Persona #1 - Chronic Illness Patient
- Persona #2 - Parent
- Screener Survey
- User Interviews
- Usability Test

Desk Research - Feasability

1. Technical Integration: Connecting to Platforms Like MyChart

It is technically feasible to connect a third-party application to medical record systems such as Epic's MyChart through the use of standardized APIs. Specifically, Epic supports integration through the SMART on FHIR protocol—a set of secure, interoperable standards that allow external applications to access patient records, provided the patient explicitly grants permission.

This architecture enables applications to request authorization from users and subsequently retrieve structured data (e.g., appointments, medications, lab results) from their healthcare providers. Other EHR vendors like Cerner, Allscripts, and Athenahealth also support SMART on FHIR, as mandated by the 21st Century Cures Act, which promotes greater interoperability and patient access to health information.

Therefore, it is not necessary to build custom integrations with each hospital or provider. Instead, a unified health data app could integrate via standardized FHIR APIs, provided it complies with necessary technical and privacy requirements.

2. Developer Access and Ecosystem Considerations

To utilize Epic's APIs, developers must register through Epic's App Orchard, which is the company's official developer platform. App Orchard provides access to technical documentation, sandbox environments for testing, and a range of APIs for various types of health information. Similar developer portals are available for other major EHR vendors. Approval to use these APIs requires compliance with specific technical, privacy, and security standards, but does not generally require individual partnerships with hospitals. However, access may vary depending on the provider's implementation and willingness to enable external connections.

3. Manual Data Entry and Uploads

For users whose providers do not support interoperable systems, or for those who prefer greater control, a complementary feature set allowing manual uploads is essential.

- Uploading scanned documents or photos of lab results
- Adding files such as PDFs or discharge summaries
- Manually entering structured data such as symptoms, medications, and appointment notes

To improve usability, the system could incorporate document recognition or tagging features (e.g., OCR) to help users classify and organize their records efficiently. This approach ensures accessibility for users whose records are scattered or not available digitally.

4. Privacy and Regulatory Compliance

Any application that stores, transmits, or processes Protected Health Information (PHI) in the United States must comply with the Health Insurance Portability and Accountability Act (HIPAA). Compliance requires:

- Encrypting all data at rest and in transit
- Ensuring user consent for all data collection and sharing activities
- Maintaining audit trails, access logs, and secure user authentication
- Implementing safeguards such as role-based access controls
- Using HIPAA-compliant cloud service providers and entering into Business Associate Agreements (BAAs) as needed

While the application may be patient-facing and not part of a clinical workflow, HIPAA-compliant infrastructure and clear privacy policies are essential to ensure legal and ethical handling of sensitive information.

5. Competitive Landscape and Precedent

Several existing solutions demonstrate the viability of this model. For example:

- Apple Health Records allows users to connect to various health systems via FHIR and view their records on iOS devices.
- OneRecord offers a patient-facing platform that aggregates records from different systems through SMART on FHIR.
- MyLinks and CareEvolution offer similar patient-mediated record aggregation services.

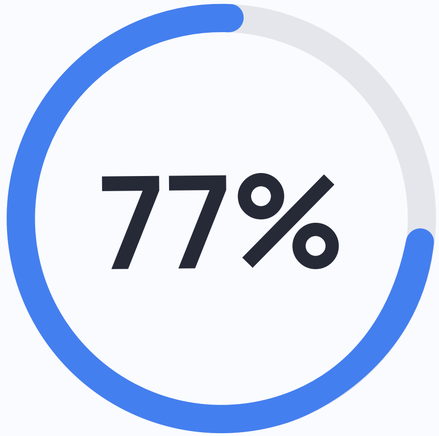
These precedents show that there is both technical feasibility and user demand for tools that simplify and centralize personal health data management.

Conclusion

The concept of a centralized platform for chronic illness patients to manage their health information is technically feasible under current interoperability standards. SMART on FHIR protocols, combined with appropriate security infrastructure and regulatory compliance, enable third-party applications to dynamically retrieve health records from major systems like Epic. In addition, supporting manual data uploads provides flexibility and broader accessibility!

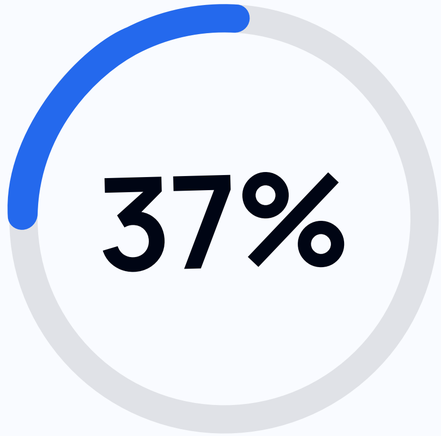
Tools Used to Manage Health Information

Screener Survey - Chronic Illness Patients



Patient Portals

Physical Binders



Virtual Notes

Symptom Tracking Apps

NT's private portal, and an out-of-network lab
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ons
uestions. She tries to cross-reference with her
spot patterns but gets frustrated with

to explain the context and show them on her
her feel dismissed.

octor in

Designing a solution that allows Maya to easily collect, prepare, and share the most up-to-date, relevant records and personal data before an appointment would lower friction at the highest-tension point and increase her confidence, clarity, and care quality.

2. Jumping Between Portals
She logs into MyChart (for two different hospitals), her ENT's private portal, and an out-of-network lab system. Each has different formats and login requirements.

Competitive Analysis

Product/ Company Name	URL of Website or App Store Location	Purpose of Site/App/Product/Service	Direct/ Indirect	App or Website	Free or Paid	Year Founded	Funding Rounds	Revenue Streams	Relevant Features	Competitive Advantage	Pros	Cons	Customer Reviews	Analysis
Epic MyChart	https://www.mychart.org/	Patient portal enabling appointment scheduling, messaging, test results view, billing, prescription refills.	Direct	Both	Free to patients; paid by providers/hospitals	1995 (by Epic Systems)	Unfunded; part of Epic	Licensing to health systems, add-on services	Appointment & results view, messaging, billing	Secure messaging, telehealth integration, billing/payment, appointment scheduling, prescription refills	Widely adopted, well integrated with EHRs, well-known, Secure and HIPAA-compliant	Siloed by hospital system, login fatigue, may incur charges for some messaging features	Positive Feedback:• "The app works perfect... better access to medical care." • "Amazing at organizing meds, refills, appointments... Seeing my test results helps me ask informed questions." Negative Feedback:• "User experience will vary... learning curve." Summary: Widely praised for ease of use and comprehensive features, but some users report setup difficulties and that features depend on provider-side implementation.	MyChart is a foundational and widely-used portal that patients already use extensively—but its system-by-system silos, billing surprises, and lack of cross-hospital coordination highlight core pain points your solution would address. MyChart is the dominant player in patient portals, but it is limited by the fact that only healthcare systems using Epic's EHR can fully integrate with it. It's a reliable tool but lacks AI features for patient data organization and proactive management of medical information.
OneRecord	https://www.onerecord.com/	Aggregates and allows patients to share their complete medical history across health systems.	Direct	Both	Free for patients	Likely around 2020s (supporting compliance with Cures Act)	Not publicly listed	Possibly subscription-model or institutional licensing	Unified health records, cross-provider sharing	Connects to Epic, Cerner, Athena, VA; complies with 21st Century Cures Act; sharing permissions	Centralized view, legal compliance, ease of sharing	Dependent on health system integration; lacks patient-friendly features like reminders or notes	Positive Feedback:• "Mind. Blown." – "Sign on & aggregate almost all records in a few minutes." Negative Feedback:• "Useless to me since none of my doctors are in the network... can't manually input info." Summary: Users love how quickly it centralizes records—when their providers are supported. However, lack of manual entry and limited integration networks are common blockers.	OneRecord provides key infrastructure that your solution builds upon, offering aggregated data and compliance. It could form a foundational layer to which your UX enhancements would add significant value.
Tempus Olivia	TBD	AI-enabled personal health concierge to centralize and make health data actionable with smart summaries	Indirect	Both	Not yet disclosed—possibly premium	Launched 2025 (by Tempus AI)	Owned by publicly-traded Tempus AI	Enterprise partnerships, licensing	AI summarization, record integration, shareable timeline	Connects with 1,000+ health systems, symphony of EHR integration, AI summaries, Q&A, clinical trial linkages	AI-drivendeep data connectionsadvanced summarization	New platform, unknown UX maturity, potential paywall	Positive Feedback:• Users appreciate seamless data import and symptom/device sync. • Literature notes you can query AI and share data across institutions. TempusNegative Feedback:• N/A Summary: Penetrates core needs—centralization, AI, onboarding across providers—but user reviews are still emerging, given the platform's newness.	Olivia tackles data centralization like OneRecord, but adds genuine AI capabilities. Your focus on emotional well-being, UX clarity, and care coordination could complement Olivia's technical strengths.
DRChrono/ OnPatient	https://www.drchrono.com/	EHR and patient portal for providers and patients; includes OnPatient for patient-facing features.	Direct	Both	Free basic access; subscription for providers, patients free	2009	Raised $20M in 2020	EHR billing, subscriptions	Appointment, messaging, labs, wearable data import	Appointment management, messaging, lab & imaging orders, Apple Watch integration	Mobile-firstAPI-enabledWearables integration	Aimed at provider-side, variable patient UX, limited cross-system aggregation	Positive Feedback:• "Easy navigation, excellent customer service," "best iPad functionality." Negative Feedback:• "Appointments and Messaging only...no control over profile... billing invisible." • "Backend unreliability, weak support, billing issues." Better Business BureauSummary: Praised for promise and device integration, yet plagued by poor feature depth—especially around user control, billing, and stability.	DrChrono offers strong API infrastructure and device integration but lacks cross-system aggregation. It's a potential technical partner or benchmark, but your solution's human-centered focus would differentiate it.
Azumio (Argus, Sleep Time)	https://azumio.com (multiple health apps)	Biometric health tracking (heart rate, sleep); Argus aggregates varied wellness data.	Indirect	App	Freemium (in-app purchases)	2011	Not publicly known	revenue via freemium and enterprise	Device data logging, trend visualization	Integrates multiple wearables, trend analysis, goal tracking	Aggregate well-being dataMotivational UX	Limited to wellness, not medical-grade EHR integration	Positive Feedback:• "Very easy to use," "love this app," helped weight loss and health tracking. Negative Feedback:• "They've killed all functions—can't record food/calories now." Summary: Celebrated as intuitive and engaging for wellness tracking but criticized for removing functionality and losing relevancy.	While not a direct medical portal, Azumio demonstrates how wearables and trend analytics can empower users. Your solution could integrate similar capabilities into a holistic medical context.
Health Gorilla	https://healthgorilla.com/	Aggregates patient health data across diffrerent EHRs, making it accessible to both healthcare organizations and patients.	Indirect	Website	Paid (for healthcare organizations and providers)	2014	$16 million in Series A funding (2020)	Revenue primarily comes from healthcare organizations, hospitals, and providers subscribing to its data aggregation services.	Data aggregation across healthcare providers (but lacks AI and organizing tools for patients).	Connects patient data from different healthcare providers and EHR systemsReal-time data sharingAnalytics and insights for healthcare providersProvides broad interoperability across multiple EHR systems, making patient data more accessible across different healthcare providers.	Strong focus on interoperabilityComprehensive and broad access to patient records	Primarily B2B, not a direct-to-consumer product, Limited features for direct patient engagement or AI-assisted tools	Positive Feedback:• "Very effective tools... customized dashboard views." Negative Feedback:• N/A (public patient reviews uncommon)Summary: Valued by providers for integration and support. User-facing feedback is limited—but strong technical performance positions it as a reliable backend solution.	Health Gorilla focuses on healthcare providers and organizations, helping them aggregate patient data from different sources. While it addresses data fragmentation, it does not directly serve patients or provide AI-based assistance for organizing their health data.
CareSpace	https://www.carespace.com/	A platform to help patients manage their medical care, offering tools for accessing medical records, appointments, and secure communication with healthcare providers.	Indirect	Both	Paid service, but pricing varies by healthcare provider subscription.	2015	Not publicly disclosed	Revenue from healthcare organizations subscribing to the platform for their patients.	Centralized data (appointments, messaging), but lacks AI or organization features.	Centralizes medical records and healthcare communicationsSecure messaging with providersAppointment scheduling and remindersFocus on improving coordination between patients and healthcare providers.	Good user experienceEnhanced communication between patients and providers	Limited AI capabilities or automation for patientsMainly a coordination platform, not a comprehensive data aggregator	Positive Feedback:• Supports scheduling, documentation, communal care features (sourceforge). Negative Feedback:• App seems focused on workspace features—not chronic patient needs. Summary: Solid care coordination tool for families/clinicians, but lacks patient-centered chronic care support across systems.	CareSpace aims to simplify patient-provider communication and manage patient data but doesn't offer the comprehensive AI-driven, cross-system aggregation of data that your project proposes.
PatientMpower	https://www.patientmpower.com/	Helps patients with chronic illnesses, particularly respiratory diseases, to track their health data and share it with healthcare providers.	Direct	App	Free with premium features available	2015	Not publicly disclosed	Paid subscriptions for premium features	Tracks medical data, but only for specific chronic conditions and without AI for organization.	Tracks chronic illness-specific data (e.g., respiratory data, medication adherence)Allows patients to share data with their healthcare teamVisualizes patient dataTailored for chronic illness management, particularly in respiratory diseases, providing a specialized focus.	Strong focus on chronic illness managementProvides easy-to-understand data visualizations	Limited to certain conditions (e.g., COPD, asthma)Lacks cross-system aggregation or AI-powered organization	Positive Feedback:• "Simplified record keeping," useful for transplant/pulmonology, Bluetooth integration. Negative Feedback:• N/ASummary: Well-loved for device syncing and data tracking in specific conditions. However, it lacks EHR or portal integration crucial for centralized medical records.	PatientMpower excels in managing chronic illness data but doesn't offer a broad solution for data fragmentation across various healthcare systems or the AI-driven features your project is proposing.
Redox	https://www.redoxengine.com/	A platform for healthcare data integration, enabling different healthcare systems and EHRs to communicate and share patient data.	Indirect	Website (B2B service)	Paid service (for healthcare organizations)	2014	$53 million in Series C funding (2020)	Primarily from healthcare providers and organizations subscribing to Redox's integration services.	It directly addresses the issue of data fragmentation in healthcare, but it is designed for organizations, not patients.	Interoperability between healthcare systems and EHRsStrong technical infrastructure for enabling data interoperability across healthcare systems.Real-time data sharing across organizationsStrong technical infrastructure for enabling data interoperability across healthcare systems.	Helps solve the problem of data fragmentation at an organizational levelFacilitates smoother healthcare delivery with real-time data sharing	Not consumer-facing; targeted at healthcare providersLimited features for patient interaction	Feedback: N/ASummary: As a B2B integration platform, Redox is well-regarded by developers but has no public user feedback in app stores.	Redox is an important player in data integration for healthcare systems, but it doesn't provide a direct consumer-facing solution or AI-driven organization tools for patients.
Otto	https://www.ottohealth.com/	Simplifies healthcare communications between patients and providers, offering telehealth and secure messaging features.	Indirect	Both	Paid (mainly for healthcare providers)	2017	Not publicly disclosed	Revenue comes from healthcare providers using the platform for patient communication.	Centralized communication but no AI or health data aggregation.	Telehealth platform for virtual appointmentsSecure messaging between patients and providersScheduling and remindersFocuses on communication between healthcare providers and patients with an easy-to-use telehealth interface.	Convenient telehealth and messaging featuresUser-friendly platform	Limited functionality beyond communication and telehealthLacks broader medical data aggregation or AI for organizing health data	Feedback: N/ASummary: Designed for provider-led chronic care workflows; little patient-side feedback available yet.	Otto Health excels in telehealth and messaging but doesn't address the problem of data fragmentation or offer AI-powered features for patients to organize and prepare for appointments.
Lumiata	https://www.lumiata.com/	Uses AI and machine learning to predict and analyze health risks based on patient data.	Indirect	Website (B2B service)	Paid (for healthcare organizations)	2013	$22 million in Series A funding (2017)	Primarily from healthcare providers and insurers subscribing to its AI-powered platform.	AI-powered analytics, but not focused on data aggregation or patient organization.	Predictive analytics and risk assessment for health outcomesAI-powered insights from medical dataStrong AI capabilities for analyzing health risks, which could be adapted for organizing health data.	AI-driven health insights and predictionsFocus on improving healthcare outcomes	Not a direct consumer-facing productLimited focus on data aggregation or organization for patients	Feedback: N/ASummary: Provider-targeted AI analytics with no patient-facing interface or consumer reviews.	Lumiata provides valuable AI-based insights into patient health, but it is not a direct competitor for your project since it lacks patient-facing features and doesn't focus on organizing or consolidating medical data.

Persona #1: Maya Thompson

Chronic Illness Patient

- Persona card
- 5 W’s
- Connection to problem statement
- Day-in-Life
- ABT User Narrative
- Supporting Narrative

Persona #1: Maya Thompson

Chronic Illness Patient

Persona - Chronic Illness Patient

Maya Thompson

Patient

- Age: 22 years old
- Tech Comfort Level: High
- Health Condition: Lupus
- Years Managing Diagnosis: 3 years
- Hospital Systems: 3 (Epic, Oracle Health, eClinicalWorks)
- Specialists: 4 (Rheumatology, Nephrology, Dermatology, Cardiology)

Bio

Maya Thompson is a 22-year-old biology major navigating her final year of college while managing life with lupus, a chronic autoimmune disease she was diagnosed with at 19 years old. Since her diagnosis, Maya has had to learn on her own how to be both a student and a patient. She is juggling late-night study sessions with early morning blood draws, fitting doctor's appointments between labs and lectures, and trying to keep some time for friends and family.

She sees four different specialists within three hospital systems which each uses a different online portal. Having her health data spread out makes it difficult to piece together a full picture of her medical history and current state. Important information like lab results, symptom trends, and provider notes are scattered and hard to interpret. Maya finds herself anxious before appointments, unsure whether she's forgotten to follow up on something or missed a key result. Despite being tech-savvy, she still feels overwhelmed trying to keep track of it all. Maya often resorts to manually taking notes and tracking symptoms in her phone or relying on online communities for support and advice.

Goals

- Wants to feel less overwhelmed managing her chronic illness
- Wants to feel more in control of her healthcare journey

Needs

- See all test results in one place
- View past and future appointment visits
- Get medical data to providers
- Organize old and new medical data
- Easily prepare for new appointments

Pain points

- Managing multiple patient portals
- Understanding lab results
- Sharing medical records with physicians
- Advocating for appropriate medical care
- Keeping up with appointments

Persona #1: Maya Thompson

Chronic Illness Patient

5 W's - Chronic Illness

5 W's Analysis:

- **Who** is affected by this problem? — Chronic Illness Patients
- **What** is actually going wrong? — Trouble managing complex medical data (multiple locations)
- **When** does the issue show up? — After/between appointments
- **Where** in is the frustration happening? — Online medical record systems for patients
- **Why** does this matter to users? — Poor medical outcomes & control/understanding of health

5 W's from Persona POV

5 W's Analysis:

- **Who** is affected by this problem?
- **What** is actually going wrong?
- **When** does the issue show up?
- **Where** in is the frustration happening?
- **Why** does this matter to users?

"People like me—young adults with chronic illnesses—who are trying to balance life, school, and managing a complex health condition."

Maya and others in her position are often new to navigating the healthcare system, yet they must manage multiple specialists and appointments just to stay stable.

"All my important health info—lab results, notes, appointment history—is scattered across different portals, and none of them actually help me understand what's going on."

She can't get a clear, centralized view of her health, which makes it difficult to stay organized and make informed decisions about her care.

"Especially between appointments, when I'm trying to make sense of what happened at the last visit, or figure out what to ask at the next one."

Moments of independent health management—like checking symptoms, reviewing labs, or preparing for a specialist—are when the burden hits hardest.

"In online patient portals. They're confusing, inconsistent, and full of medical jargon I don't always understand."

Even though she has access to the data, the format and delivery create stress instead of clarity.

"Because not understanding my own health can lead to missed symptoms, worse flares, or even ending up in the hospital. I want to feel like I'm in control—not constantly playing catch-up."

For chronic illness patients, being disorganized or uninformed can have real medical consequences. Maya's desire isn't just convenience—it's about safety, agency, and peace of mind.

Persona #1: Maya Thompson

Chronic Illness Patient

Explicitly Connect Persona to Problem

Maya, and others like her, are dealing with chronic illnesses that require them to manage a lot of important medical information—like lab results, doctor notes, and upcoming appointments. But all of this information is spread out across different hospital systems and patient portals that don't work well together.

Because of this, Maya struggles to keep track of what's happening with her health. She often feels overwhelmed, confused, and unsure about what steps to take next. This can lead to missed details, more stress, and even delays in getting the care she needs.

I'm working to solve this problem by creating a tool that helps people like Maya see all their health information in one place, understand what it means, and feel more confident managing their care. The goal is to make life a little easier—and safer—for people dealing with complex, long-term health issues.

Revised Problem Statement

Problem Statement:

The individuals who manage or receive care across multiple medical systems experience fragmented medical data, which leads to overwhelming stress, communication issues, and delays in care. Solving this problem will reduce the emotional burden on patients by helping them manage, track, and share their health information more easily. This is important because individuals can easily access medical data in a centralized and up-to-date location resulting in improved health outcomes.

Persona #1: Maya Thompson

Chronic Illness Patient

Day-in-Life Timeline

Key Moments

1. Prepping for a Specialist Appointment

Maya is preparing for a neurology follow-up. She's unsure which lab results her doctor has received and which ones she needs to resend herself.

- **Who:** Maya (chronic illness patient)
- **What:** Unsure what records the doctor has
- **When:** Before appointment
- **Where:** Across portals and email
- **Why:** Lack of shared system and visibility

2. Jumping Between Portals

She logs into MyChart (for two different hospitals), her ENT's private portal, and an out-of-network lab system. Each has different formats and login requirements.

- **Who:** Maya (chronic illness patient)
- **What:** Logging into multiple platforms
- **When:** Before appointment
- **Where:** Online portals (MyChart x2, private systems)
- **Why:** Fragmentation between systems

3. Organizing Her Notes & Questions

Maya opens a note on her phone to list symptoms and questions. She tries to cross-reference with her Google Docs symptom timeline and her menstrual app to spot patterns but gets frustrated with switching between apps.

- **Who:** Maya (chronic illness patient)
- **What:** Cross-referencing systems and data
- **When:** Before appointment
- **Where:** Phone apps, Google Docs
- **Why:** No centralized place to track data

4. At the Appointment

The doctor doesn't have the latest lab results. Maya has to explain the context and show them on her phone. The provider seems rushed and skeptical, making her feel dismissed.

- **Who:** Maya (chronic illness patient) & Doctor
- **What:** Doctor missing info and patient has to fill the doctor in
- **When:** During appointment
- **Where:** In person
- **Why:** Records not available/shared in advance

5. After

She leaves the appointment feeling stressed. Maya wanted to discuss more of her concerns with the doctor but most of the appointments was taken up by discussing the results the doctor didn't get.

- **Who:** Maya (chronic illness patient)
- **What:** Disappointing appointment
- **When:** After appointment
- **Where:** Email
- **Why:** Test results not shared properly

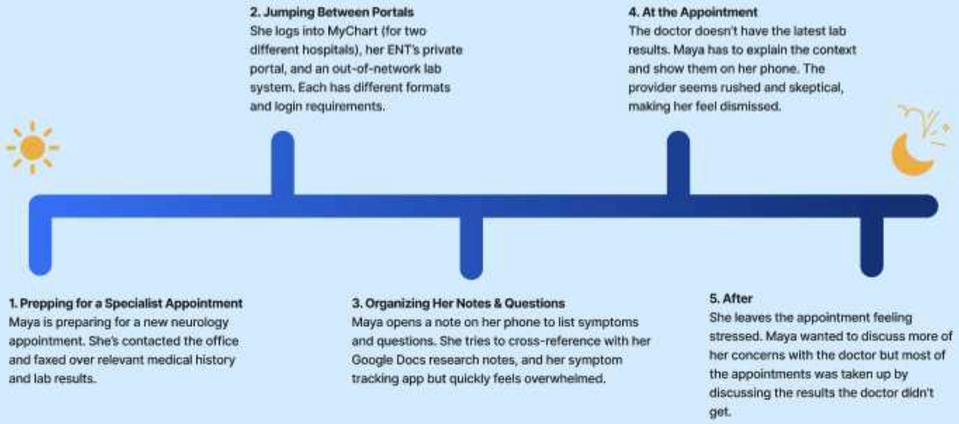
Highest-Tension Point

Moment 4: At the appointment — doctor lacks critical info, and Maya must advocate with incomplete tools.

This is the emotional peak because Maya is vulnerable, in a high-stakes setting, and must manually fill gaps in the system, even when the provider seems doubtful or unreceptive. This moment shows how the system's fragmentation directly affects patient confidence, stress, and quality of care.

Design Opportunity Highlight

Designing a solution that allows Maya to easily collect, prepare, and share the most up-to-date, relevant records and personal data before an appointment would lower friction at the highest-tension point and increase her confidence, clarity, and care quality.



A Day in the Life

Maya Thompson

1. Prepping for a Specialist Appointment
Maya is preparing for a new neurology appointment. She's contacted the office and faxed over relevant medical history and lab results.

2. Jumping Between Portals
She logs into MyChart (for two different hospitals), her ENT's private portal, and an out-of-network lab system. Each has different formats and login requirements.

3. Organizing Her Notes & Questions
Maya opens a note on her phone to list symptoms and questions. She tries to cross-reference with her Google Docs research notes, and her symptom tracking app but quickly feels overwhelmed.

4. At the Appointment
The doctor doesn't have the latest lab results. Maya has to explain the context and show them on her phone. The provider seems rushed and skeptical, making her feel dismissed.

5. After
She leaves the appointment feeling stressed. Maya wanted to discuss more of her concerns with the doctor but most of the appointments was taken up by discussing the results the doctor didn't get.

A Day in the Life

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Highest Tension Point!

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5. After
She leaves the appointment feeling stressed. Maya wanted to discuss more of her concerns with the doctor but most of the appointments was taken up by discussing the results the doctor didn't get.

Persona #1: Maya Thompson

Chronic Illness Patient

ABT User Narrarive

ABT User Narrative:
Maya is a 22-year-old managing a chronic illness and sees multiple specialists across several hospital systems. **And** she uses a mix of portals, apps, and physical tools to stay organized. **But** these systems are fragmented, forcing her to manually coordinate care, resend test results, and track appointments alone, leaving her overwhelmed and burned out. **Therefore**, we need a centralized, user-friendly solution that helps patients like Maya manage and share their health information with less stress and greater control.

Reflection:
Developing this narrative helped me fully realize how deeply the problem of fragmented medical data impacts not just task completion but a user's emotional and cognitive well-being. Originally, I viewed the issue as one of inconvenience - annoying, but manageable with enough tools. However, my interviews revealed a much heavier truth: patients like Maya are carrying the full weight of care coordination. They're doing this while managing complex, often debilitating conditions.

What surprised me most was how universal the emotional toll was. Words like "overwhelmed," "exhausted," and "burned out" came up again and again, often paired with stories of missed diagnoses or distrust in providers. This made it clear that solving this issue is about restoring trust, control, and mental energy for people navigating already difficult health journeys.

This clarity has helped me focus my solution not just on organizing information, but on designing relief so patients can focus less on paperwork and more on healing.

Maya's Constraint, Asset, Boundary

Constraint
Limited time as a busy college student juggling chronic illness, work, school, and social life.

Asset
Has a supportive online network of others with chronic illness.

Boundary
Wants medical information safe and secure

Persona #1: Maya Thompson

Chronic Illness Patient

Supporting Evidence

What evidence supports this problem?

Example 1:
A 2023 JAMA study found that approximately 60% of patients with chronic illness use more than one patient portal, and only 28% said they could easily find all their test results in one place. (Link)

Example 2:
A Reddit user in the r/ChronicIllness community wrote:
"I have to keep a spreadsheet of my labs, meds, and appointments because the hospital portal doesn't even show everything. I've missed abnormal bloodwork results more than once." (Link)

Example 3:
In a 2022 Pew Research survey, 1 in 4 adults said they had difficulty understanding medical terminology in their health records. Many turned to Google or friends to translate test results. (Link)

Example 4:
Personal experience/accounts from others with chronic illnesses.

Supporting Secondary Data

1. Disparities in Patient Portal Use Among Adults With Chronic Conditions
A 2024 study revealing that adults with chronic conditions often struggle with using multiple portals and face significant digital access barriers. (Link)

2. How Health Systems Can Transform Fragmented Data Into a Unified Patient Experience
This article outlines the problems of data fragmentation in healthcare and how systems can create seamless experiences for patients. (Link)

3. What Data Fragmentation Means for the Patient
Explores the patient-side consequences of fragmented data, including difficulty understanding care plans and reduced engagement. (Link)

4. Use of Patient Portals by People with Long-Term Health Problems
A PCORI-funded project that studied how patients with chronic conditions engage with portals and where current systems fall short. (Link)

5. Patients with Complex Chronic Conditions: Health Care Use and Clinical Events Associated with Access to a Patient Portal
Shows the correlation between portal access and better outcomes, while highlighting the barriers to effective use. (Link)

6. The Promise of Patient Portals for Individuals Living With Chronic Illness
A qualitative study exploring how people with chronic illness experience portals—many find them valuable but hard to navigate. (Link)

7. A Unified Approach to Health Data Exchange
Editorial advocating for unified health records and systems to reduce errors and improve outcomes. (Link)

8. Overcoming Data Fragmentation Is Key to Avoiding Future Health Care Crises
Highlights the risks of disjointed health information systems, especially for patients managing long-term health conditions. (Link)

Persona #2: Rachel Turner

Parent

- Persona card
- 5 W’s
- Children’s Medical Privacy
- Day-in-Life
- ABT User Narrative
- Supporting Narrative

Persona #2: Rachel Turner

Parent

Persona - Parent/Caretaker

Rachel Turner

Mother/Caretaker

- Age: 38 years old
- Tech Comfort Level: Moderate
- Children with health conditions: 2
- Hospital Systems: 4 (Epic, Oracle Health, eClinicalWorks, NextGen Healthcare)
- Specialists: 5 (Allergist, Pulmonologist, Rheumatologist, Dermatologist, Gastroenterologist)

Goal

- Doesn't want to miss any important information about her children's health
- Wants to spend less time managing health documents and more time with her family

Needs

- Easily switch between medical profiles
- View past and future appointment visits
- Get medical data to providers
- Receive reminders and notifications
- Easily understand medical data

Bio

Rachel is a working mom of three children (7, 10, and 13 years old) and manages the healthcare logistics for her family. In particular, her youngest and middle child have health conditions that require regular specialist visits and medications. Her youngest was diagnosed with an autoimmune disease called Cohn's Disease and her middle child has severe asthma and allergies. Rachel juggles different hospital systems, insurance portals, and MyChart accounts for each family member and often has to use separate logins or manage proxy access.

She tries to stay organized using shared calendars and a home filing system, but medical data fragmentation makes it hard to get a clear view. Sometimes she misses messages from providers or needs to dig through emails to find lab results. She often feels like she has a second job with the hours she spends managing all the healthcare data.

Pain points

- Managing multiple patient portals
- Understanding lab results
- Sharing medical records with physicians
- Keeping up with each child's medical needs
- Forgetting appointments

Persona #2: Rachel Turner

Parent

5 W's

5 W's - Chronic Illness

5 W's Analysis:

Who is affected by this problem?	Parents and caregivers
What is actually going wrong?	Trouble managing complex medical data (multiple locations)
When does the issue show up?	After/between appointments
Where in is the frustration happening?	Online medical record systems for patients
Why does this matter to users?	Poor medical outcomes & control/understanding of health

5 W's from Persona POV

5 W's Analysis:

Who is affected by this problem?	Rachel, a working mother of three children all with different providers, systems, and health needs.
What is actually going wrong?	She struggles to keep track and interpret medical data and messages across fragmented medical patient portals.
When does the issue show up?	This challenge shows up most acutely before and after appointments (e.g., when new test results come in).
Where in is the frustration happening?	Across email, texts, different hospital systems and personal tools.
Why does this matter to users?	Because each child has a portal and unique health journey. Some systems allow for proxy access and others do not.

Reflection:

Rachel's pain point isn't just access, it's cognitive load and lack of centralized clarity. She worries she might miss something serious, and current tools leave her with the burden of manually stitching together information that's scattered and unclear.

Persona #2: Rachel Turner

Parent

Childrens Medical Privacy

Age Based Access Tiers

Age Group	Access Model	Notes
0-11 years	Full proxy access for parents	Child does not directly access their account. Parent can view and manage all data.
12-17 years	Limited proxy with segmented visibility	Protects sensitive categories (e.g., sexual/reproductive health, mental health, substance use treatment). Parent only sees non-sensitive info unless adolescent consents.
18+ years	User-controlled access	Patient decides what, if anything, is shared with others (e.g., caregivers or parents).

Customizable Proxy Settings

Allow patients (and teens, when legally permitted) to customize what data is shared with a proxy. This empowers privacy while supporting helpful oversight.

For example:

- "Maya has chosen to allow her mother to view appointment dates and messages, but not lab results or visit notes."

This could be handled through:

- A "Manage Access" dashboard within the app.
- Granular controls per data type (appointments, meds, results, etc.).
- Pre-set privacy templates (e.g., "Default Teen Settings").

Audit Logs & Transparency

Offer visibility into who has accessed what data:

- "Mom viewed your appointment schedule on July 17."
- "You granted Dr. Green access to your full records on July 10."

Audit logs help build trust and accountability.

Persona #2: Rachel Turner

Parent

Day-in-Life Timeline

Key Moments

1. Portal Pile-Up

Rachel receives four new notifications across three patient portals:

- A follow-up lab result for her daughter's food allergy test
- Physical therapy notes for her son
- A vaccine update for her toddler
- A general wellness message for one of the kids from their pediatrician

She opens one email but doesn't have time to log in and check them all. Each portal has a different login, layout, and messaging system.

- **Who:** Rachel
- **What:** Notices test result notifications piling up
- **When:** Monday morning while making breakfast
- **Where:** Phone notifications, email
- **Why:** Fragmented portals, no central dashboard

2. Quick Check

At work during lunch, Rachel taps open MyChart. She finds the lab results for her daughter's allergy test, but doesn't fully understand what the numbers mean. There's no clear explanation. She screenshots it to review later, but forgets. She hasn't even looked at her son's PT notes or the pediatrician's message yet.

- **Who:** Rachel
- **What:** Trying to interpret test results
- **When:** Midday, between errands
- **Where:** Phone, in car
- **Why:** Lack of time and poor data clarity

3. Lingering Anxiety

At work, Rachel remembers she never checked the note from the pediatrician. She's hit with a sense of guilt and wonders if there was something she missed. Did the message include a recommended follow-up? A medication note? She tells herself she'll do it after dinner, but by then, the kids need homework help and bedtime routines. The message stays unread.

- **Who:** Rachel
- **What:** Forgets to follow up on test results/messages
- **When:** Late afternoon
- **Where:** At work, later at home
- **Why:** Ongoing cognitive overload; low-priority tasks in a high-pressure day

4. Worry and Wonder

At the park, a friend mentions her child's bloodwork flagged something serious that they almost missed. Rachel immediately wonders: "What if I missed something too?" Her mind goes back to the unread notes and confusing results. She opens her notes app and types: "Go back and check allergy numbers. Look up PT notes." The list grows — but the time doesn't.

- **Who:** Rachel
- **What:** Feeling uncertain and fearful about missed details
- **When:** Saturday morning
- **Where:** Park
- **Why:** No centralized or supportive system to flag or summarize important findings

Highest-Tension Point

Highest-Tension Point: The Emotional Cost of Uncertainty

Rachel feels like she's constantly falling behind — not because she's disorganized, but because the system is. She's the point person for every provider and every portal. She doesn't want to miss anything serious, but it's impossible to give every message and result the attention it deserves.

Design Opportunity Highlight

A unified caregiver dashboard with:

- AI-powered result summaries
- Alert prioritization by severity or type
- Appointment prep packets
- Optional explanations in plain language

Persona #2: Rachel Turner

Parent

ABT User Narrarive

ABT User Narrative:

Rachel is a busy working mom of three children, **and** she's deeply committed to keeping up with each child's appointments, test results, and medical needs across multiple health systems.

But with every child using a different portal, messages arriving asynchronously, and no clear prioritization or summaries, she feels constantly behind—worried she might miss something important.

Therefore, caregivers like Rachel need a centralized, intuitive platform that brings together family medical data in one place, with smart AI-powered summaries and alerts that help her focus on what matters most—without missing a beat.
This framing highlights both the emotional stakes (overwhelm, worry, guilt) and the system-level problem (fragmented, uncoordinated medical information) that your design solution can address.

Persona #2: Rachel Turner

Parent

Supporting Evidence

1

Caregiver Preferences Regarding Personal Health Records in Pediatric ADHD

Reference: Ross, Caroline MD et al., Caregiver preferences regarding Personal Health Records in the management of pediatric ADHD. BMC Medical Informatics and Decision Making, 2015 ACM Digital Library

Summary:
This mixed-methods study surveyed parents of children with ADHD who had access to MyChart patient portals. Findings showed that while most parents recognized the potential benefits—like accessing appointment schedules, messaging, and refill requests—actual usage was low (~23%). Major barriers were limited awareness, interface usability issues, and lack of functionality tailored to pediatric caregivers.

Relevance:
These insights align with your persona Rachel, highlighting that caregivers face real usability challenges navigating multiple portals and features not optimized for managing children's health data. It underlines the importance of designing a caregiver-centric interface.

2

The Experiences of Caregivers of Children With Medical Complexity

Reference: Cohen, Erika M. et al., Fitting the Pieces Together – The Experiences of Caregivers of Children With Medical Complexity. Hospital Pediatrics, 2023 AAP Publications

Summary:
This qualitative study surveyed and interviewed caregivers of medically complex children, revealing that caregivers consistently shoulder the burden of care coordination—managing multiple providers, interpreting records, and reconciling conflicting instructions across systems. The fragmentation of medical data impairs their ability to provide seamless care.

Relevance:
The study reinforces the emotional and logistical overload Rachel experiences —validating your narrative that fragmented data is not just an inconvenience, but a direct driver of caregiver stress and potential gaps in care.

3

Caremap: A Digital Personal Health Record to Coordinate Care for Children With Complex Health Needs

Reference: Duke/Boston Children's Health Digital PHR Project, Caremap: A Digital Personal Health Record to Coordinate Care for Children With Complex Health Needs. Duke Innovation & Health, 2024
sciencedirect.com+13dihi.org+13AAP Publications+13

Summary:
Caremap is a FHIR-enabled digital personal health record co-designed with caregivers and clinicians. It aggregates data from multiple EHR systems and supports parent-reported information, care goals, and shared communication with providers. The paper notes that caregivers consistently reported unmet needs in accessing consolidated health data for their children.

Relevance:
This is a direct analog to your capstone's goal. Caremap's outcomes show that caregiver-centric aggregation and documentation tools can reduce fragmentation, affirming the feasibility and importance of your approach.

Screener Survey - Questions

Chronic Illness Patients

#	Question	Response Type	Logic
1	Have you been diagnosed with a chronic illness or long-term medical condition?	Yes/No	• Yes - Continue • No - Submit form
2	Do you regularly see more than one doctor or specialist for your care?	Yes/No	
3	How many different healthcare systems or hospitals have you used in the past year?	• Only one • Two • Three or more	
4	What tools do you use to manage your health information? (Check all that apply)	• Patient Portal (MyChart, FollowMyHealth, Oracle Health, NextGen, etc) • Virtual Notes (Notes app on phone, Google Docs, Spreadsheet, etc) • Physical Notes (Printed documents, paper notebook, binder, etc) • Health/Symptom Tracking Apps (Apple Health, Bearable, MyPainDiary, etc) • I don’t track anything • Other: _____	
5	How do you usually feel about managing your medical records and appointments?	Open ended	• Yes - Continue (following questions ask to input name and email) • No - Submit form

Screener Survey - Results

Chronic Illness Patients

Key Themes from Survey Responses

Emotional Experience of Managing Medical Data (Open-Ended Responses):

- Overwhelmed appeared explicitly in 17 different responses, and was indirectly expressed in others through phrases like:
  - “Stressed and ill equipped”
  - “It’s a full time job”
  - “Annoyed… it’s a pain”
  - “I stopped going… nothing ever happens”
  - “Exhausting at times”
- Common emotional themes:
  - Cognitive overload (due to multiple systems, duplicate entry, etc.)
  - Lack of control
  - System fatigue / burnout
  - Discouragement leading to disengagement from care

Quotes to Highlight:

“Overwhelmed and wish I had a better system”
“It’s a full time job—I feel like I have to case manage my own health issues”
“Getting records from John’s Hopkins is impossible”
“I have honestly stopped going… nothing ever happens after my appointments”

Tool Usage Breakdown (Quantitative Question)

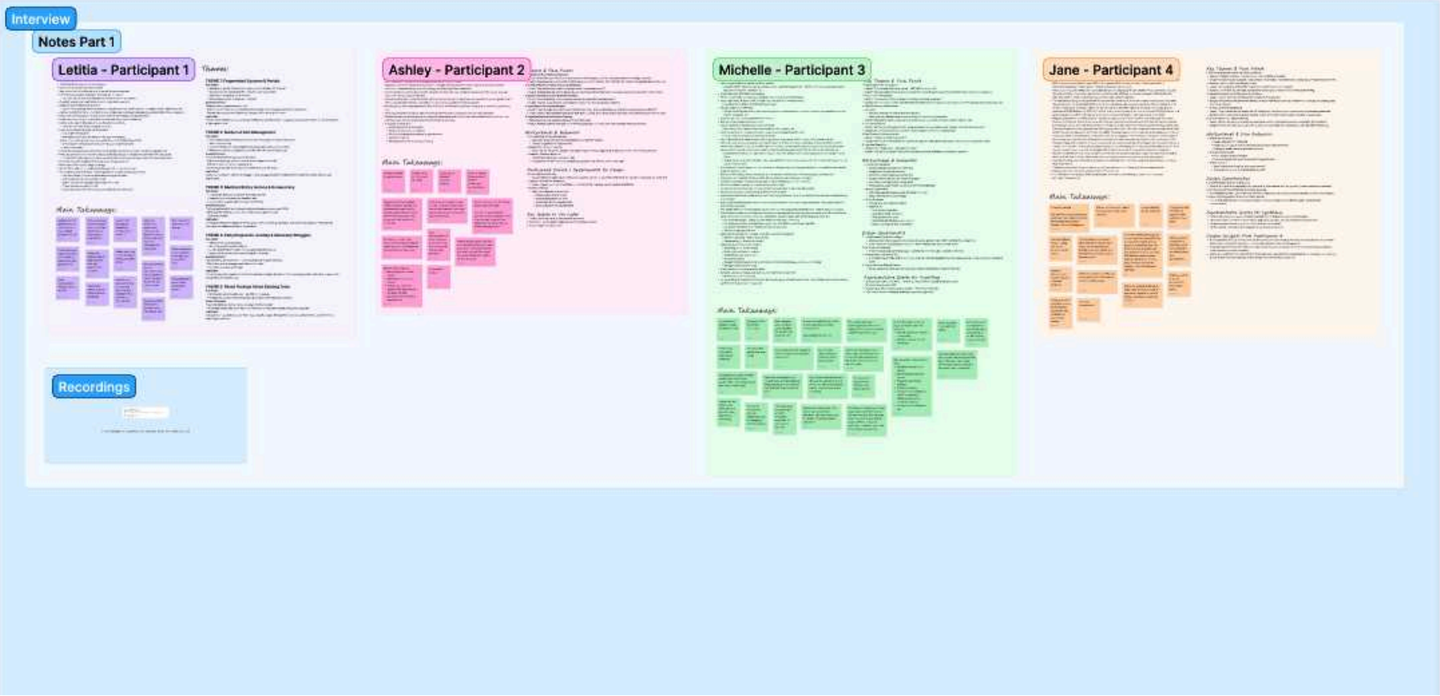
Based on ~40 responses, many respondents use a multi-tool system:

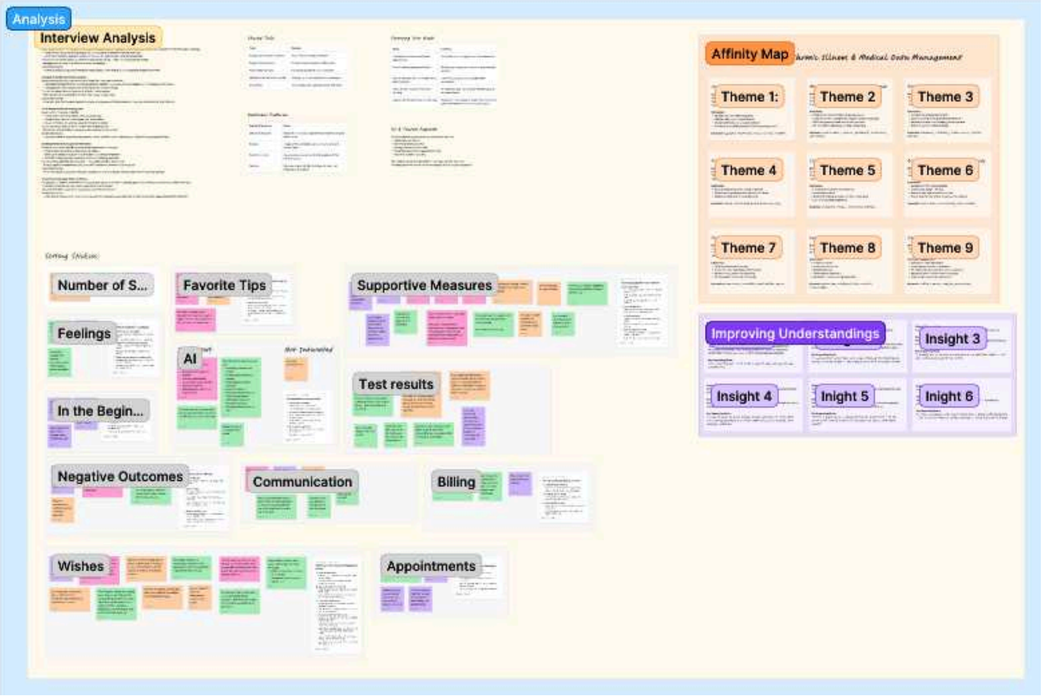
- Patient Portals (MyChart, etc.): 31 responses
- Virtual Notes (e.g., phone Notes app): 15 responses
- Physical Notes (binder, folders, etc.): 20 responses
- Health/Symptom Tracking Apps: 12 responses

This suggests users combine digital and analog tools, building custom systems to compensate for poor integration.

User Interviews

Chronic Illness Patients



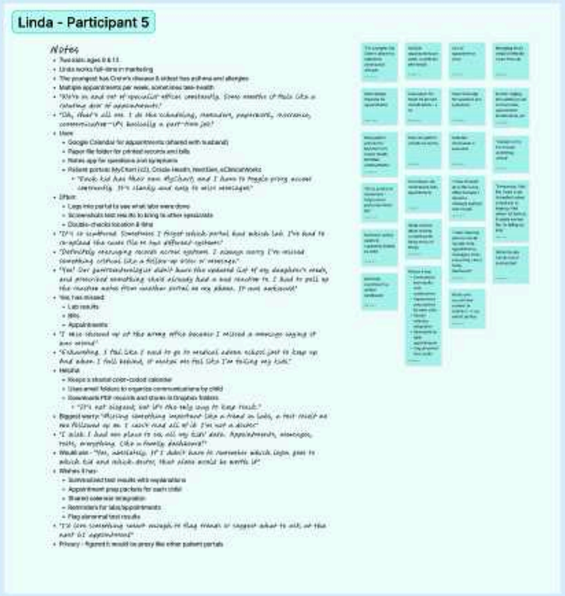


User Interviews

Parents

Planning

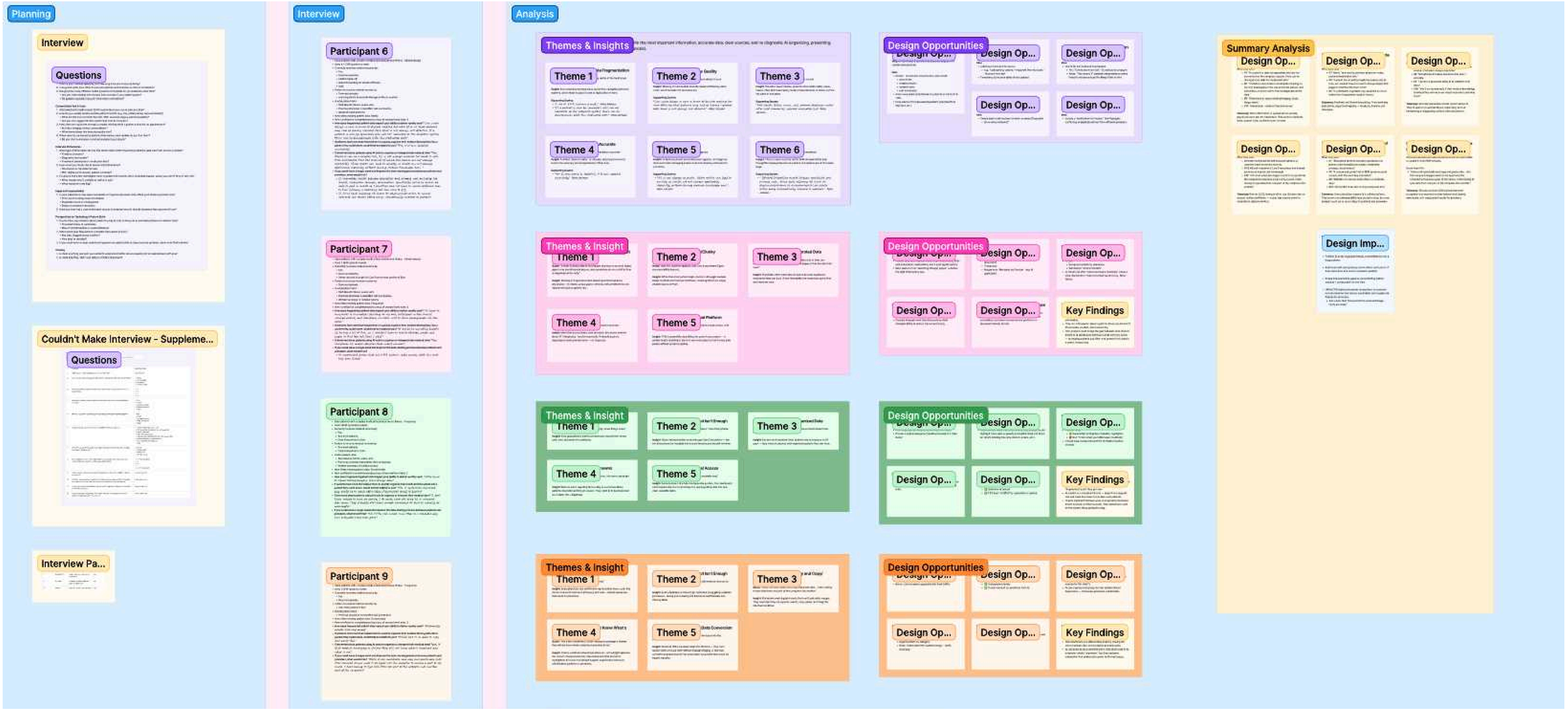
Interview



Analysis

User Interviews

Physicians



Usability Test

Notes