Lemur 1.5 Enhancement

Critical improvements to PlushCare homegrown EMR (electronic medical record) tool

- Project overview
- Process
- Researh
- Design & Strategy
- Next step

PlushCare

Objective

The objective of this project is to identify the challenges PlushCare physicians face using Lemur today. It will outline design solutions to improve the user's experience.

My contribution

As the first designer with holistic ownership of the design process, I was responsible for the project from strategy to implementation. This included research, synthesis, wireframes, prototypes, validation, designs, and collaboration with developers.

Because we lacked a PM on the team, I took over planning responsibilities. This included providing research based guidance directly to the engineering team, building critical workflows, participating in sprints and quarterly planning to prioritize and balance scope. In addition, I communicated with the clinical and product teams to influence the product vision based on feedback.

About PlushCare

PlushCare is a membership-based telehealth company that offers virtual primary care and mental health treatment.

About Lemur
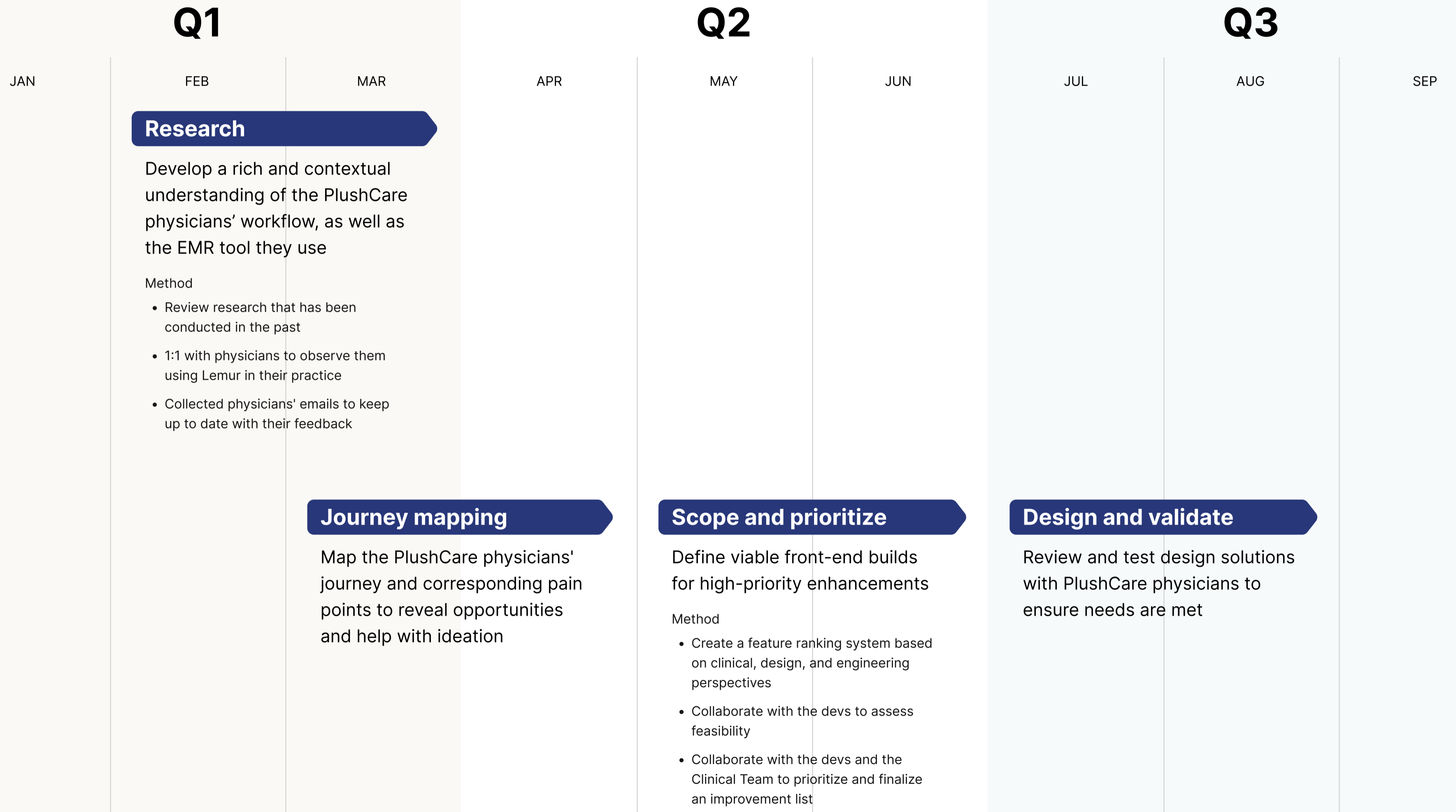
Lemur is the EMR (electronic medical record) tool that was built in-house to facilitate PlushCare's unique clinical flow.
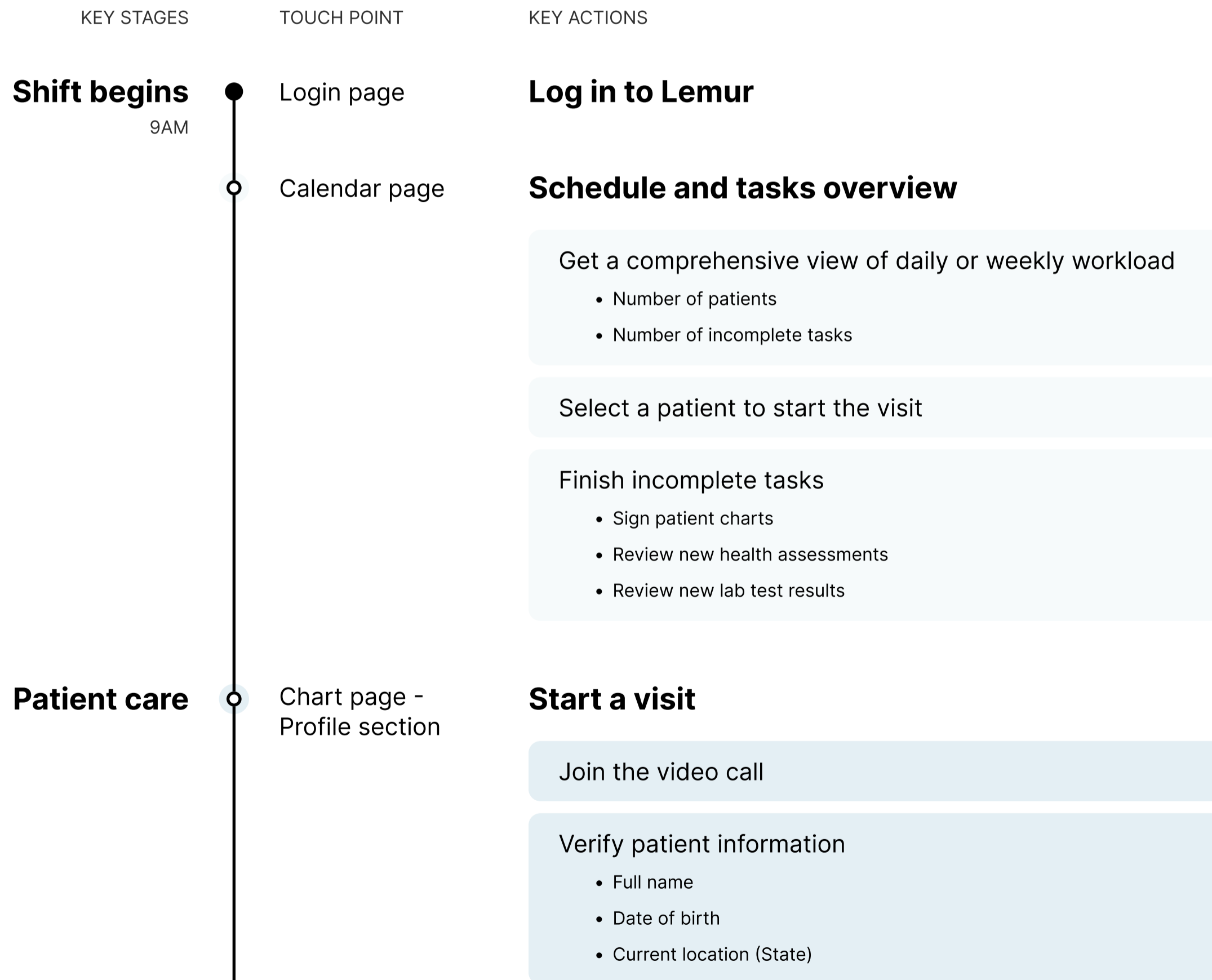
About Platform Team

In January 2021, I was hired as the lead designer for the Platform Team in charge of Lemur and other internal tools.

Upon joining, the Platform Team consisted of one tech lead, three back-end developers, one full-stack developer, and one QA.

Approach & Timeline

| Q1 | Q2 | Q3 |

| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |

Research

Develop a rich and contextual understanding of the PlushCare physicians' workflow, as well as the EMR tool they use

Method
- Review research that has been conducted in the past
- 1:1 with physicians to observe them using Lemur in their practice
- Collected physicians' emails to keep up to date with their feedback

Journey mapping

Map the PlushCare physicians' journey and corresponding pain points to reveal opportunities and help with ideation

Scope and prioritize

Define viable front-end builds for high-priority enhancements

Method
- Create a feature ranking system based on clinical, design, and engineering perspectives
- Collaborate with the devs to assess feasibility
- Collaborate with the devs and the Clinical Team to prioritize and finalize an improvement list

Design and validate

Review and test design solutions with PlushCare physicians to ensure needs are met

Research

How does Lemur play an essential role in a PlushCare physician's daily workflow?

KEY STAGES	TOUCH POINT	KEY ACTIONS	PAIN POINTS

Shift begins
9AM

Login page

Log in to Lemur

Calendar page

Schedule and tasks overview

Get a comprehensive view of daily or weekly workload
- Number of patients
- Number of incomplete tasks

The calendar only supports "day view" or "week view" which is not comprehensive enough for physicians to plan their future shifts.

Select a patient to start the visit

Finish incomplete tasks
- Sign patient charts
- Review new health assessments
- Review new lab test results

Physicians are not notified directly on Lemur when an appointment has been canceled. It requires them to check their email for updates before starting a patient's care.

Patient care

Chart page - Profile section

Start a visit

Join the video call

Verify patient information
- Full name
- Date of birth
- Current location (State)

Physicians are not notified when the patient has joined a video call. As a result, physicians are sometimes late to their appointments.

Chart page - Subjective section

Getting to know the patient

Listen and document the patient's "Subjective" experiences and complaints

Patient's history page (in a new tab)

Review the patient's medical history and doctor notes from past visits

Chart page - Subjective section

Update the patient's medical history
- History of present illness (HPI)
- Current medications and conditions
- Allergies
- Family history

The patient's medical history is not viewable from the chart page. It requires the physician to switch between multiple tabs and windows.

Personal health information is not available if the patient did not fill out the health assessment prior to the appointment. As a result, physicians need to spend time asking questions and documenting answers.

Chart page - Objective section

Review "Objective" data

Review vital signs and past lab test results

Review pertinent images shared by the patient
- Photos (e.g. infection area, progress notes from other healthcare professionals)
- Medical imaging (e.g. x-rays)
- Lab results

Virtual physical exam and documentation

Currently, physicians manually upload images in Lemur to a patient's medical history. However, the images are saved on the "visit" level and can only be accessed in the future if the physician remembers which specific visit it was uploaded to.

Chart page - Assessment section

Assess and diagnose

Review "Subjective" and "Objective" evidence to identify the patient's illness

Document the diagnosis in a format that satisfies insurance reimbursement requirements

Physicians have to re-enter diagnoses each time under a patient's current condition to update the patient's medical history. This is required even if the patient has the same diagnoses from a previous visit.

KEY STAGES	TOUCH POINT	KEY ACTIONS		PAIN POINTS

**Chart page -
Plan section**

Develop a treatment plan

Prescribe medications and send prescriptions to patient's pharmacy
- Medication name, quantity, form
- Instruction, number of refills

Order lab tests

Provide referrals

Gather visit and treatment notes for patient

Schedule a follow-up appointment or sequence of appointments for on-going care

Create work or school note if needed

**Chart page -
Sign section**

Finish conversation

Wrap up conversation and end the video

Finish documentation and sign the encounter chart

Next patient   Calendar page   **Start next visit**

Sidenote

PlushCare physicians see 25 patients/day on average (Janurary 2021)

15 min/patient = 375 min = 6 hr 15 min spent using Lemur

End of shift   Calendar page   **Finish incomplete tasks**
6PM
- Sign patient charts
- Review new health assessments
- Review new lab test results

Physicians must scroll back to the Profile section in order to assign a pharmacy for the patient.

Like the Assessment section, physicians must manually enter diagnoses multiple times to associate them with specific treatments.

Physicians do not have visibility of their own schedule.As a result, follow-up appointments may fall on a date they are not available.

Overall

Lemur is well-received by PlushCare physicians because it is based on a form of written documentation many already use called SOAP note, which stands for subjective, objective, assessment and plan. However, Lemur suffers from usability issues because design considerations were not taken into account in the past.

"*In 15 minutes I've got to talk to them, I've got to do my charting, I've got to finish their chart because I don't have time to go back at 6 o'clock and go back through and go through their chart. I've got to finish their chart, which means figuring out what their diagnosis is, write it all, send off their meds, labs, finish my assessment and plan, in 15 minutes, with the patient. That is tough. I don't get any breaks.*"

Dr. Allison Lovell

Problem

The numerous intermediate steps to complete tasks is hindering productivity. It is creating a burden on physicians to work unpaid hours in an effort to finish their charts.

Goal

The goal is to improve Lemur's **efficiency**, so valuable time is saved for a patient's care. In order to achieve this, physicians need **timely access to patient history** and **a quicker way to document each visit**.

Identify quick wins

I created a feature ranking system to help my team select a list of viable front-end builds. It was important to take into account our limited engineering resources and to consider the ease of design implementation in the future.

This list of high impact changes was reviewed multiple times by internal stakeholders to ensure we delivered the most critical improvements.

Prioritization criteria

- Low level of effort from engineering
- High impact in improving efficiency
- Simple implementation to future Lemur redesign

Toal design solutions: 10
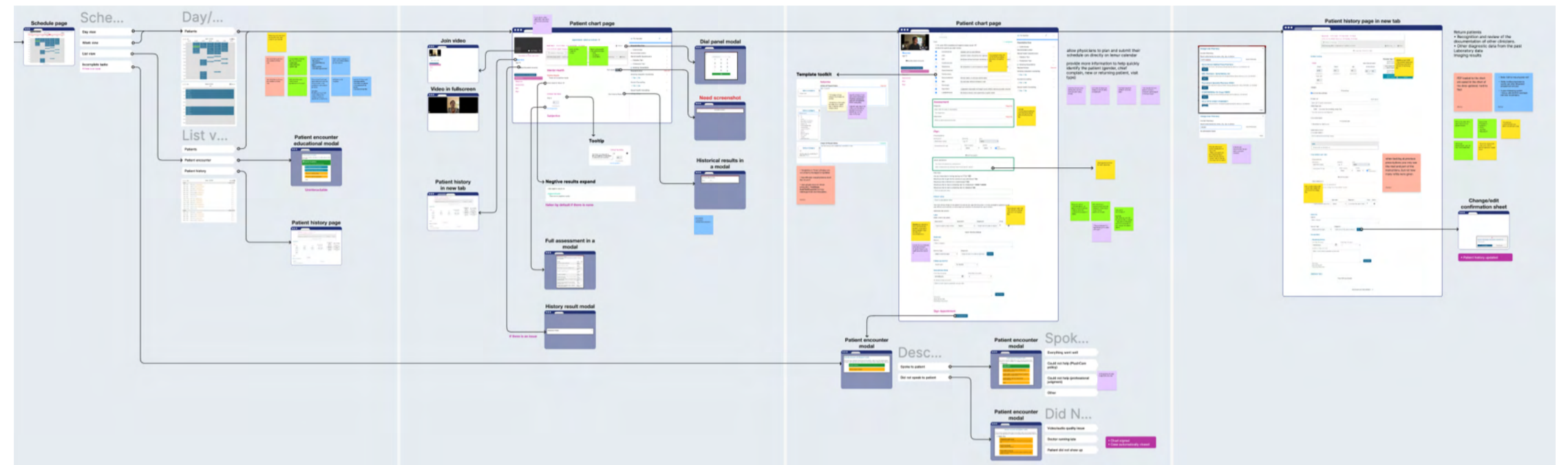
Final Lemur 1.5 enhancement candidates

1.5 enhancement - 1

Auto-populate diagnoses

Auto-populate diagnoses/ICD codes to multiple destinations from a single entry

1.5 enhancement - 2

Universal patient image access

Add an image section on the Patient's history page in Lemur

Auto-populate diagnoses

Pain point

Diagnoses/ICD codes are required to be inputed in multiple sections of the chart:

1. **Problem list** under Medical history in the Subjective section

2. **Diagnoses** in the Assessment section

3. **Prescriptions** in the Plan section

4. **Labs** in the Plan section

5. **Referrals** in the Plan section

However, there is no mechanism that will allow a physician to quickly enter recurring diagnoses. They must manually enter each diagnosis, again and again, in all of the sections listed above.
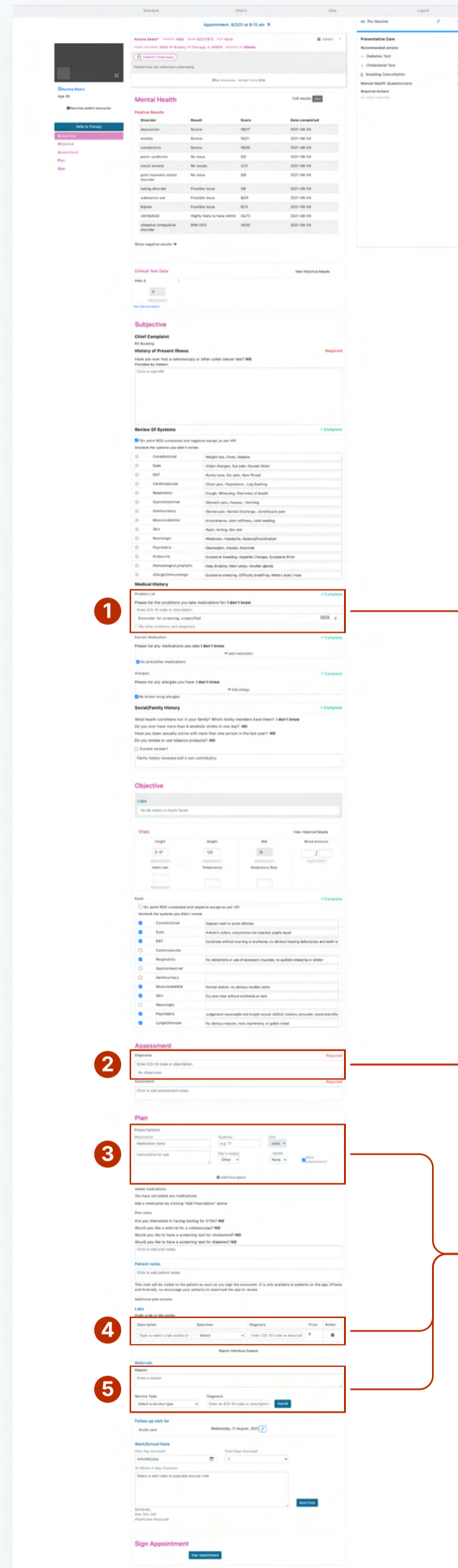
Problem list in Subjective

This is the section where physicians document a patient's current medical conditions and relevant past medical history.

Diagnoses in Assessment

Physicians document medical condition(s) addressed during the visit.

Prescription, Labs, Referrals in Plan

Physicians associate each diagnosis with an individual treatment.

Auto-populate diagnoses

Goal

Eliminate the redundancy of entering diagnoses/ICD-codes multiple times throughout the chart.

Solution

- Create a module that can distribute diagnoses/ICD codes to multiple sections that require the data
- Add a dropdown selection to every treatment option in the Plan section. This will allow physicians to quickly associate a treatment with a diagnosis
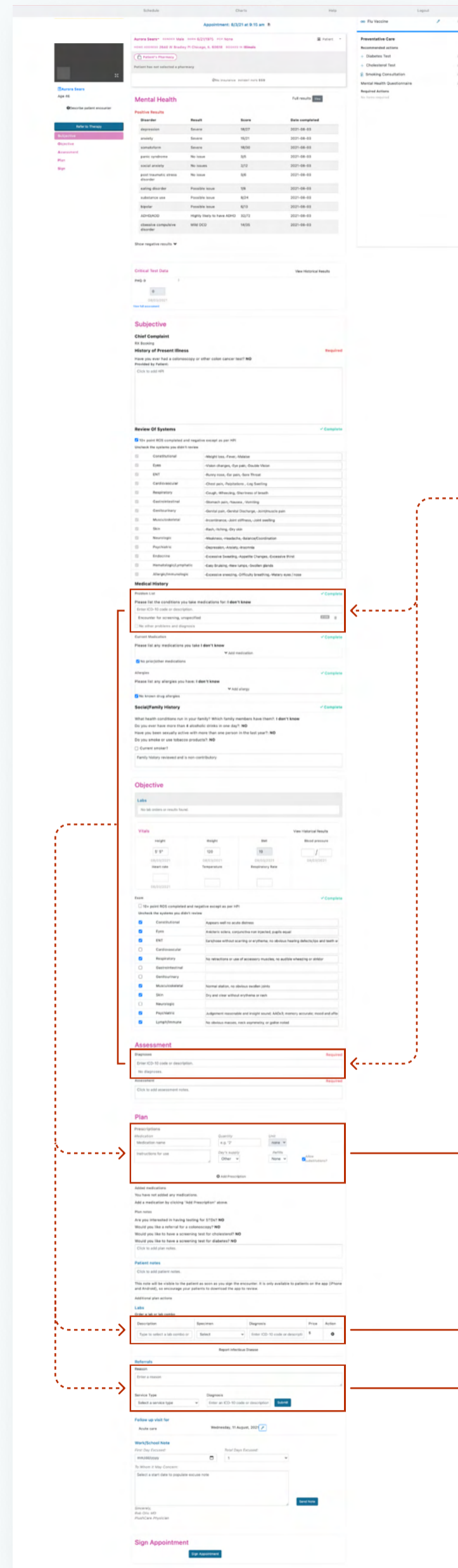
The diagnoses module

A module for inputting diagnoses is added to the Problem list in the Subjective section and Diagnoses in the Assessment section.

Every diagnoses added through this module will automatically populate in the correct sections.

Universal patient image access

Pain point

Image documentation is an important part of a patient's care. Common patient images include photos (e.g. infection area, progress notes from other healthcare professionals), medical imaging (e.g. X-rays), and lab results. Patients share images by emailing their physicians.

Currently, physicians manually download and then upload images to a patient's medical history in Lemur. However, the entry point for uploading photos is only available on the chart page, which means the images are saved on the "visit" level and can only be accessed in the future if the physician remembers which specific visit it was uploaded to.
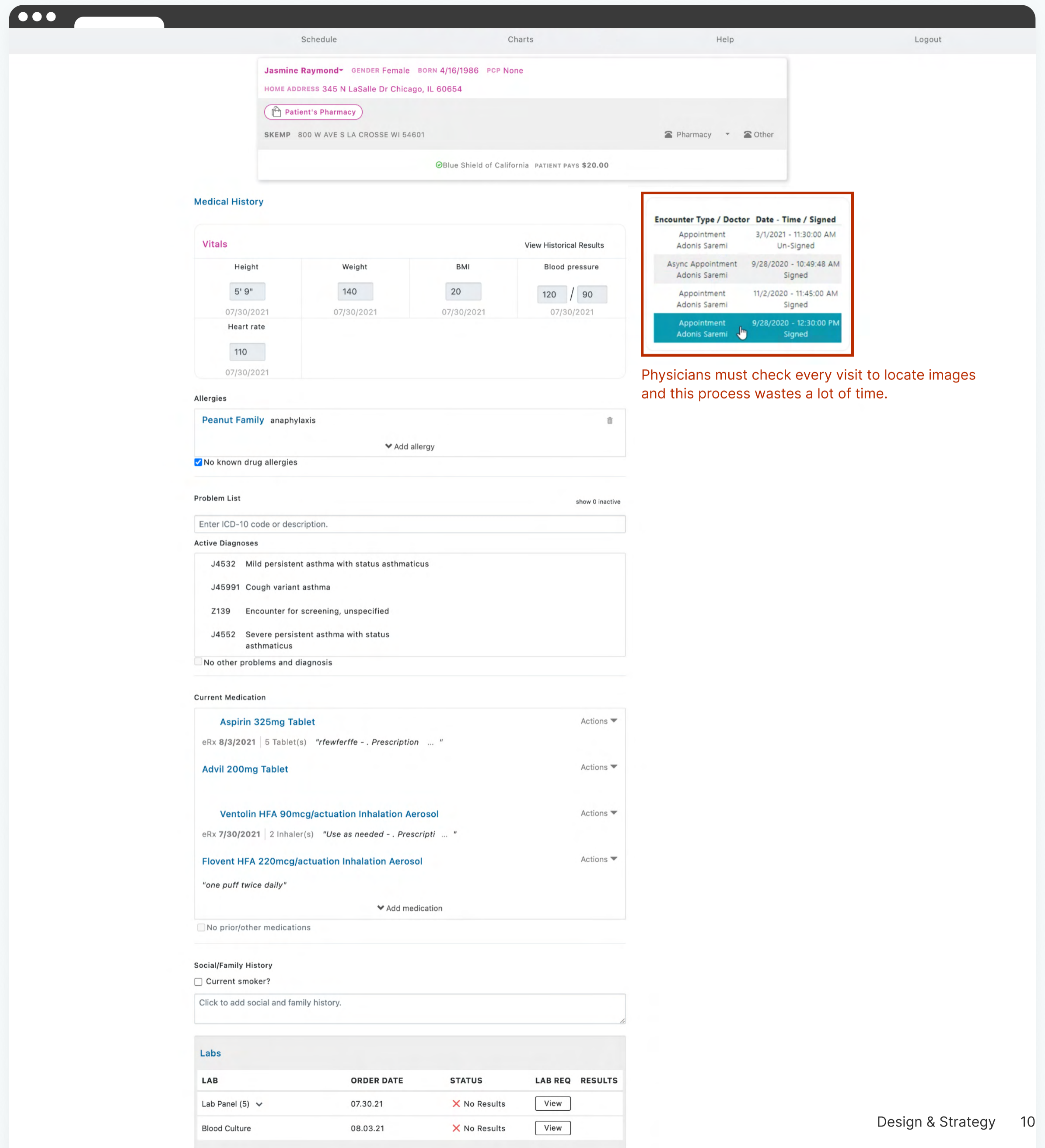
Physicians must check every visit to locate images and this process wastes a lot of time.
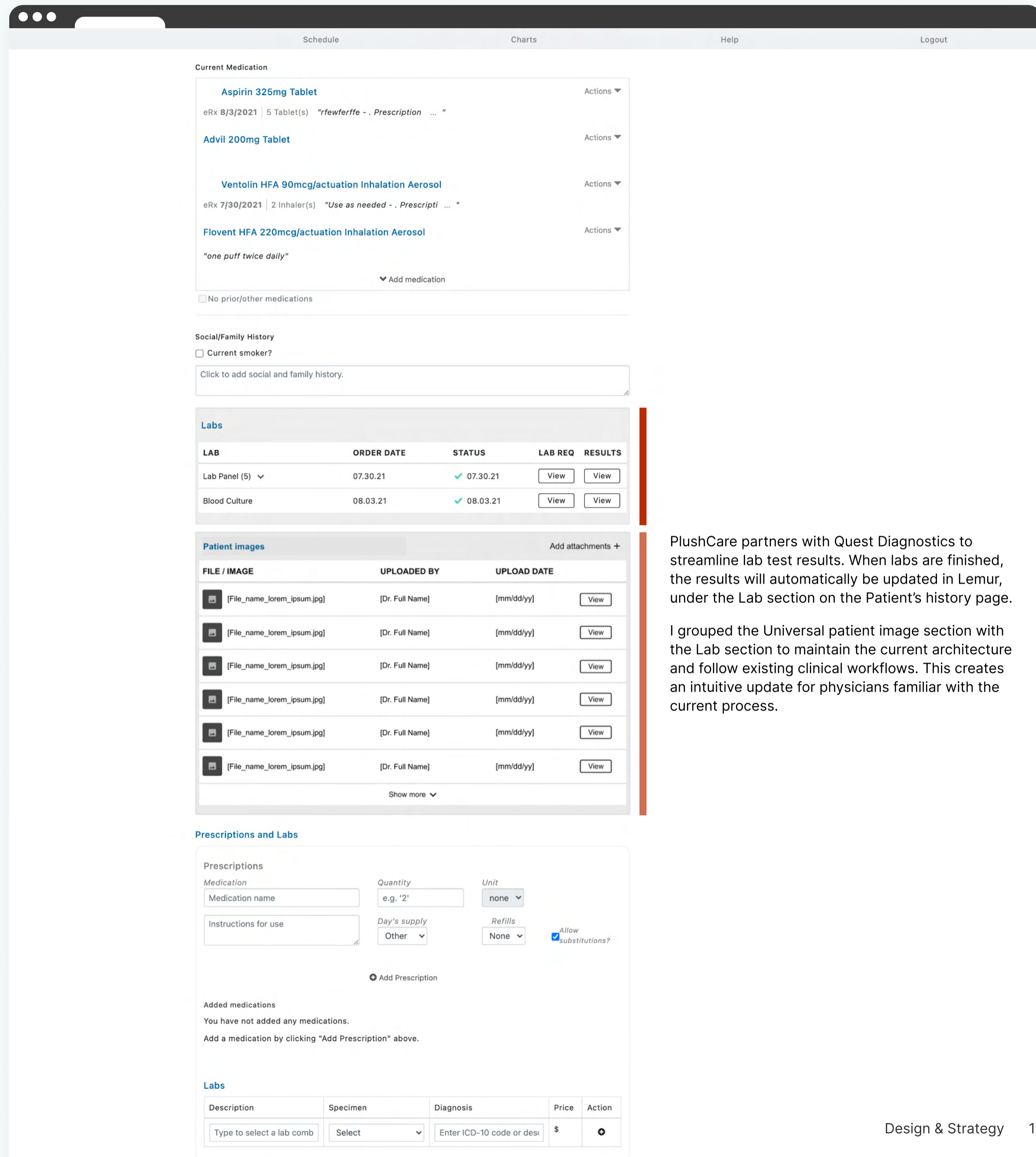
Universal patient image access

Goal

Provide quick access to previous patient images during a visit.

Solution

Create a universal access point on the Patient's history page where physicians are able to:

- View all previous images of a patient in a single location
- Upload and save more images for a patient in the same location

PlushCare partners with Quest Diagnostics to streamline lab test results. When labs are finished, the results will automatically be updated in Lemur, under the Lab section on the Patient's history page.

I grouped the Universal patient image section with the Lab section to maintain the current architecture and follow existing clinical workflows. This creates an intuitive update for physicians familiar with the current process.

Next step

Moving forward to implementation

The two design solutions proposed for 1.5 Lemur Enhancement were reviewed and tested by PlushCare physicians. The feedback from the testing period was overwhelmingly positive. Many physicians agreed that the changes would significantly speed up their workflow.

During the validation period, I communicated design changes with the engineers on my team to ensure we maintained scope. At the end of Q3, I was able to include both improvements to Product Q4 planning by creating tickets for the Platform team.