

Healthra

An Integrated Health Client Portal

A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

Project Team



Nicholas Amorim



Sarah Shabbir



Shivani Aggarwal



Smavehyia Shahid

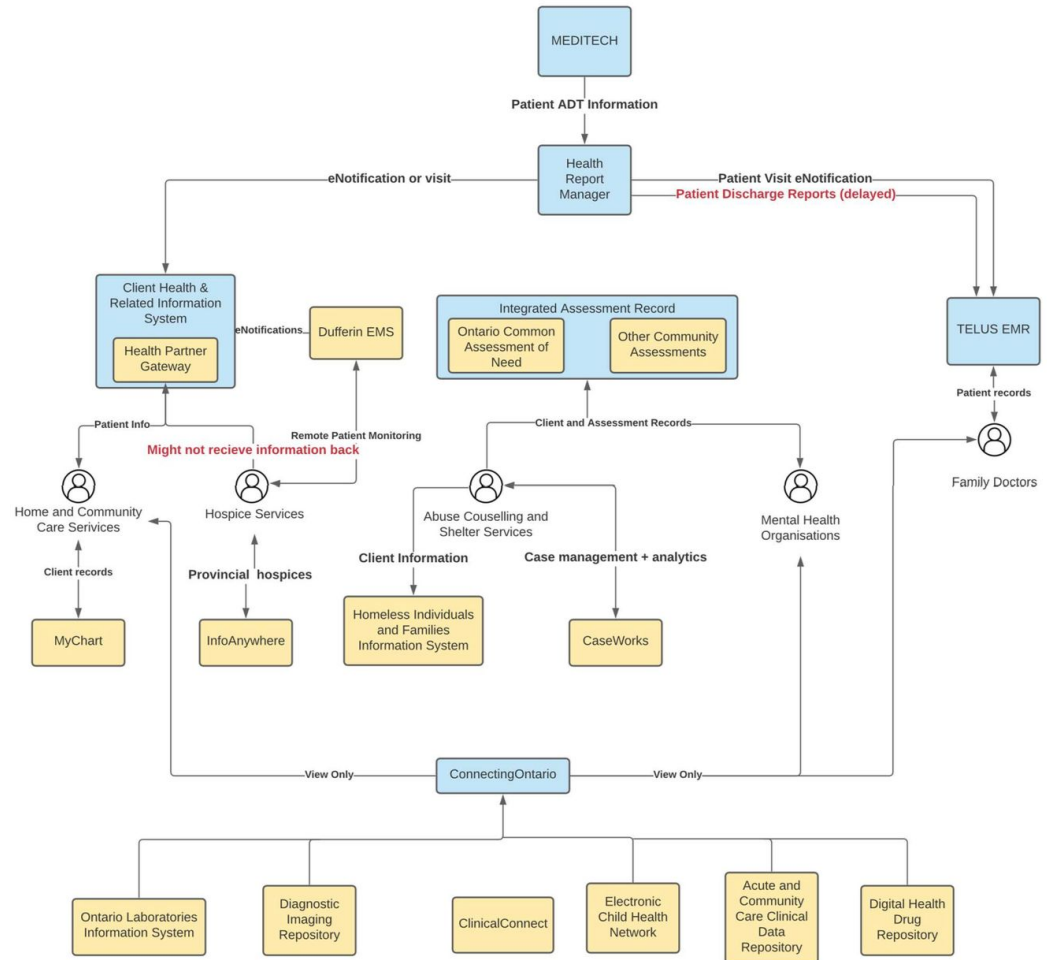


Hyeyeon Shin

Project Scope

- Generic Problem Space
 - Poor integration of healthcare services in Ontario
- Industry partner Hills of Headwaters Collaborative Ontario Health Team
 - Focusing on addressing this problem within the Dufferin-Caledon Region
 - Disintegrated information systems resulting in poor patient experience, specifically in mental health services
 - Guided by the The Ministry of Health's Digital First for Health Strategy for digital solutions

Current System State



Situation Impact Statement

Design a system to be used by clients and their delegates in the Dufferin-Caledon region to manage their mental health care plan online that meets Fast Healthcare Interoperability Resources (FHIR) standards as well as provincial security standards.

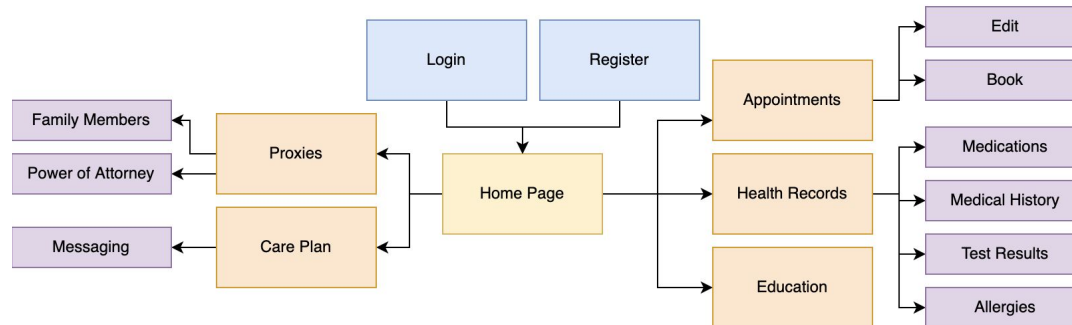
Key Functionality

Frontend (Shivani, Sarah, and Hyeyeon)

- View health records through the portal
- Book and management appointments
- Add a “proxy” (eg: family member, substitute decision maker)

Backend (Nicholas and Smavehyia)


- Populate portal with health information
- Seamless integration with existing systems
- Scalable to support exchange of high volumes of data



Iterative Design Method (Frontend)

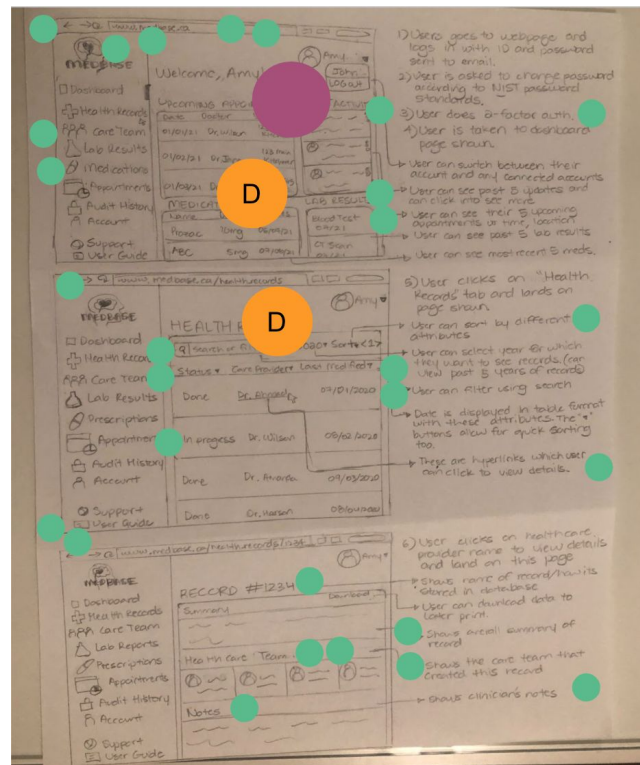
- Needs Assessment
 - Situation of Concern
 - Personas
 - User Journey Map
 - QFD
- High-level Requirements:
 - The patient portal interface must be easy-to-use
 - User must be able to quickly access desired health information
 - User must be able to understand desired health information

Secondary User - Delegate

Emil Robertson: 		User Story: Emil is a fund accountant at RBC and currently lives in Orangeville, Ontario with his wife, Laura, and son, Jamie. Jamie is 19 and constantly experiences fear and anxiety over social situations and currently sees a psychiatrist. Laura and Emil hate seeing him suffer and try to support him the best they can. Emil loves watching soccer with Jamie, woodworking with him, and eating Italian food. Jamie gave Emil consent to be added as an authorized secondary contact at the psychiatrist's office so that he can keep up to date with his condition. Emil periodically calls or emails the psychiatrist office to get updates about Jamie's condition, but he finds it to be a tiresome process. Emil wishes that he could view Jamie's health information on his own, without having to constantly contact the psychiatrist's office.		
Age: 38 Location: Orangeville, Ontario (Dufferin-Caledon Region) Occupation: Fund Accountant at RBC		Goals: <ul style="list-style-type: none">- Get updates about Jamie's health condition- View Jamie's health records at the psychiatrist's office- Support Jamie	Needs: <ul style="list-style-type: none">- An easy way to view Jamie's health information at the psychiatrist's office	Frustrations: <ul style="list-style-type: none">- He has to sometimes stay on hold for extremely long periods of time when he calls the psychiatrist's office- He has to wait for a reply when he emails the psychiatrist's office
Personality: Kind Talkative Energetic Loving Athletic		Big Influences: <div><div>Son</div><div>Colleagues</div><div>Friends</div><div>Woodworking</div><div>Wife</div><div>Leo Messi</div><div>Italian Food</div><div>Soccer</div></div>		

Iterative Design Method (Frontend)

- Conceptual Design (Synthesis)
 - Design Sprint
 - Heat Mapping
 - Sketching
- Engineering Design and Analysis
 - Human Factors and Design Principles
 - Information Architecture (IA)
 - User Research
 - Competitor Research



Iterative Design Method (Frontend)

- Testing & Evaluation
 - Comparison to established criteria
 - Usability Standards (ISO 9241-11)
 - Effectiveness
 - Efficiency
 - Satisfaction
 - FHIR Standards
 - Expert Feedback

Health Records Feature

Shivani Aggarwal

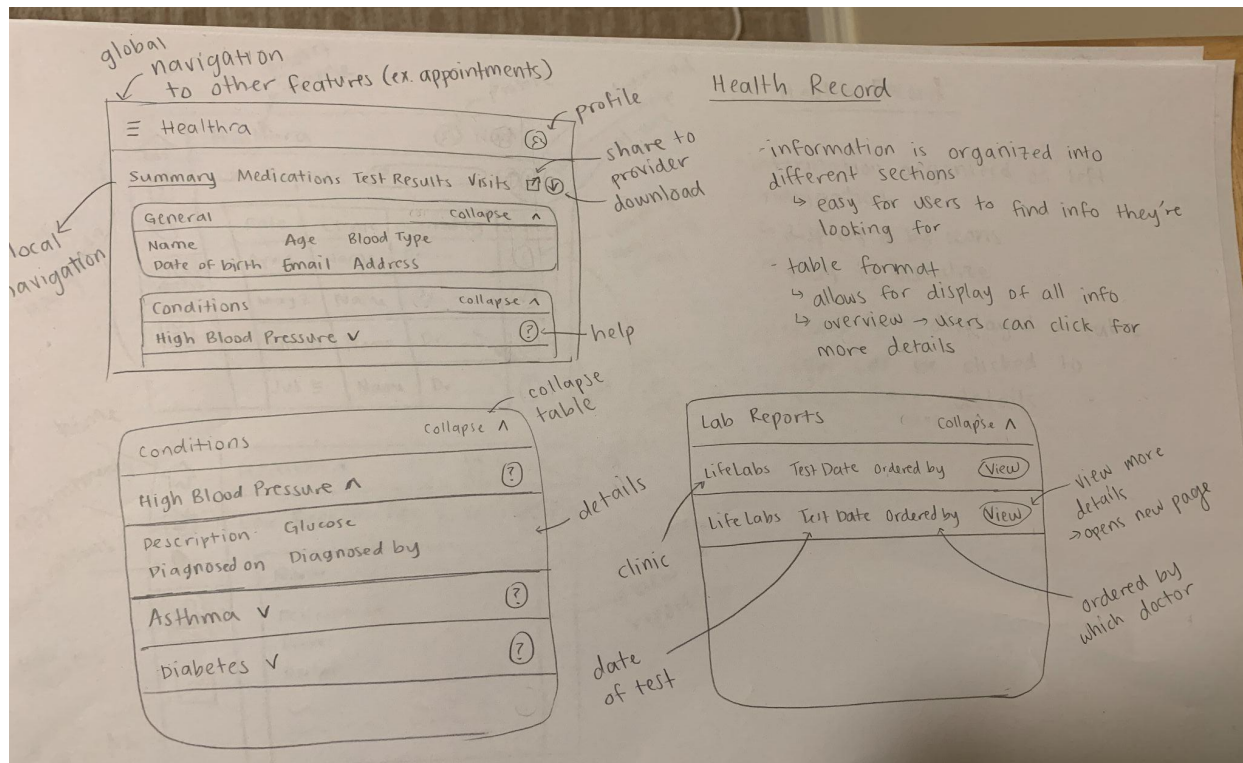
A dark blue diagonal gradient bar that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

Requirements

- The portal must allow users to access health information quickly (measured through time-on-task and number of user interactions)
- The portal must contain all of the information that patients would be able to view in their Electronic Health.
- Education resources must be made available so that patients can learn about their health information.
- User must not be overwhelmed by the information shown on a single page (less than 5-9 blocks of information at a time)
 - Users must be able to easily navigate the web pages and find the information that they are looking for

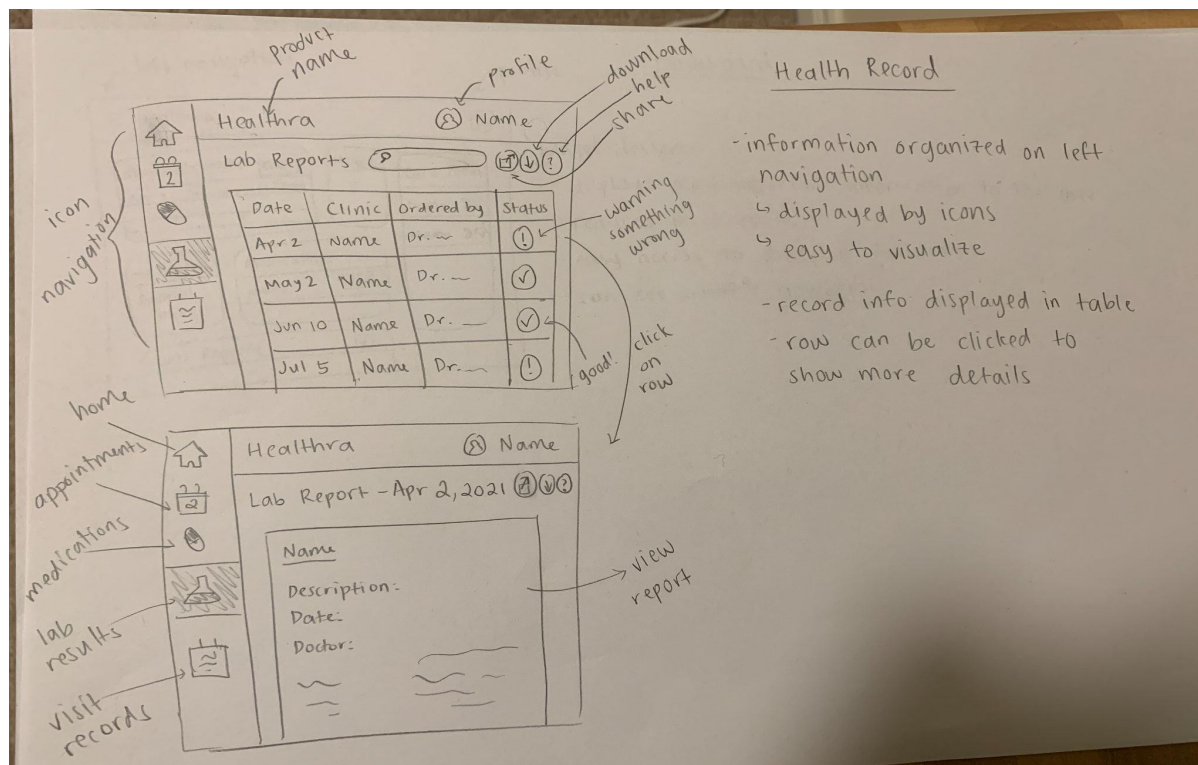
Health Records – Sketch #1

- Collapsible Tables
- Top navigation
- Words for labelling

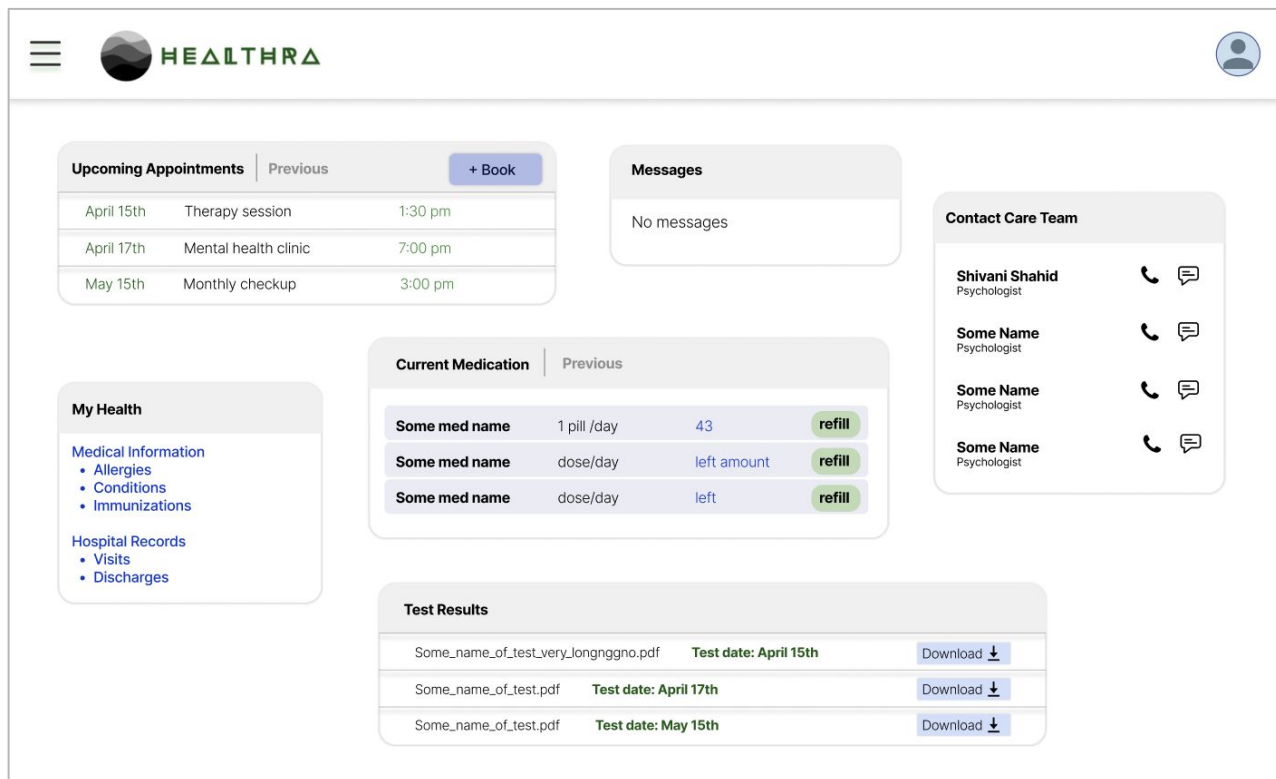


Health Records – Sketch #2




- Table layout
- Left navigation
- Icons for labelling



Design Iteration #1 – Dashboard



Design Iteration #1 – Health Summary



My Health

[Summary](#) [Medications](#) [Test Results](#) [Clinic Visits](#) [Medical History](#) [Hospitalizations](#) [Share](#) [Download](#)

General

Collapse

Name: Emily West

Age: 22

Address: 44 Lemon Lane, L3A 0E3

Email: emilywest@gmail.com

Ethnicity: Canadian

ID: 22882

Date of Birth: June 10, 1999

Sex: Female

Phone: 416-999-9999

Language: English

Blood Type: B+

Current Conditions

Collapse

Asthma

High Blood Pressure

Type 2 Diabetes

Description: Text goes here

Diagosed by: Dr. Michael Adams

Medications: Medication names

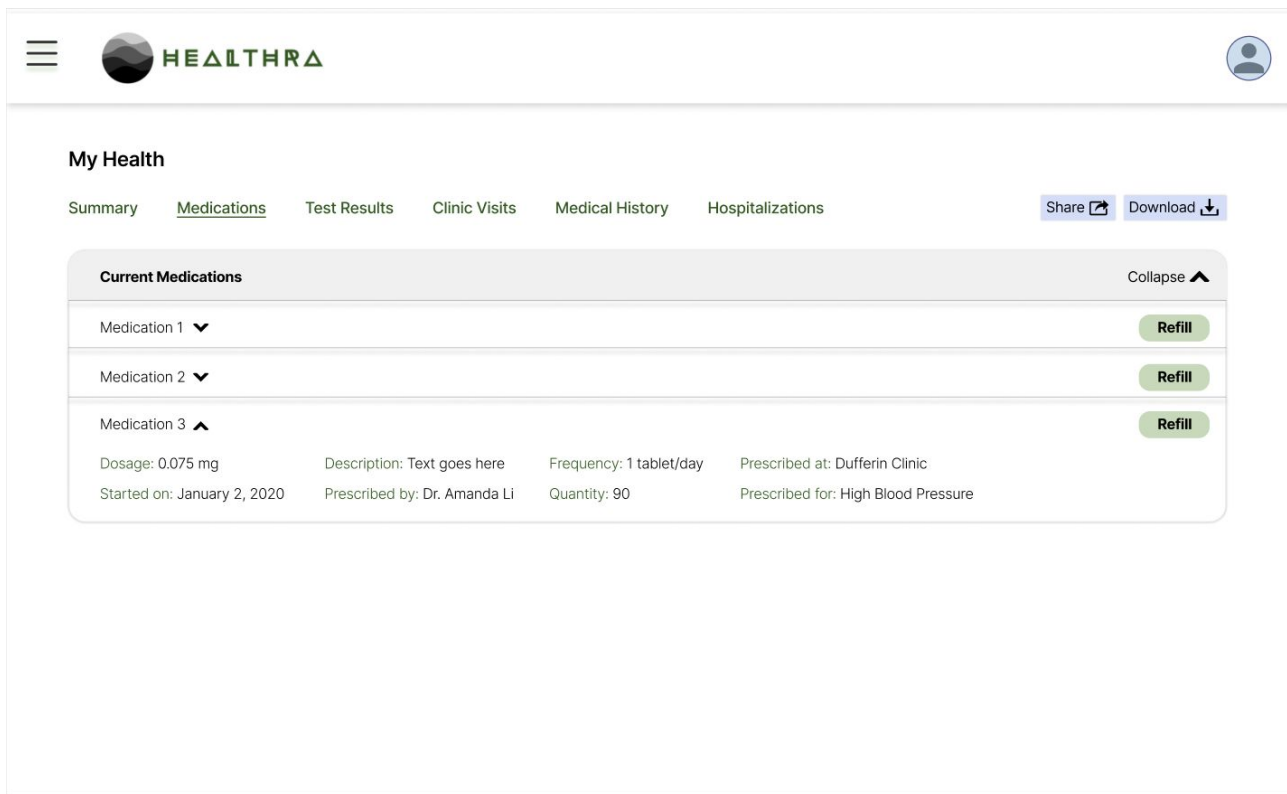
Body weight: 65 kg

Diagnosed on: January 2, 2020




Diagnosed at: Dufferin Clinic

Glucose: 100 mg/dl

Design Iteration #1 – Medications



Design Iteration #1 – Test Results



My Health

[Summary](#) [Medications](#) [Test Results](#) [Clinic Visits](#) [Medical History](#) [Hospitalizations](#)

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Lab Reports

Collapse

[Filter](#)

LifeLabs	Test date: April 2, 2021	Ordered by: Dr. Lina Wang	View
LifeLabs	Test date: March 23, 2021	Ordered by: Dr. Ellen Martin	View
Life Labs	Test date: February 1, 2021	Ordered by: Dr. Daniel King	View




< 1 2 3 4 5 ... 10 >

CT Scans

Collapse

Dufferin Clinic	Test date: May 12, 2021	Ordered by: Dr. Ellen Martin	View
Dufferin Clinic	Test date: April 21, 2021	Ordered by: Dr. Ellen Martin	View
Dufferin Clinic	Test date: March 15, 2021	Ordered by: Dr. Daniel King	View

Design Iteration #1 – Test Details



My Health

[Summary](#)[Medications](#)[Test Results](#)[Clinic Visits](#)[Medical History](#)[Hospitalizations](#)

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LifeLabs - ID: 28392[Collapse](#)

Name: First Last

Patient ID: 0000

Age: 22

Sex: Female

Order Date: Apr-02-2021

Collection Date: Apr-02-2021

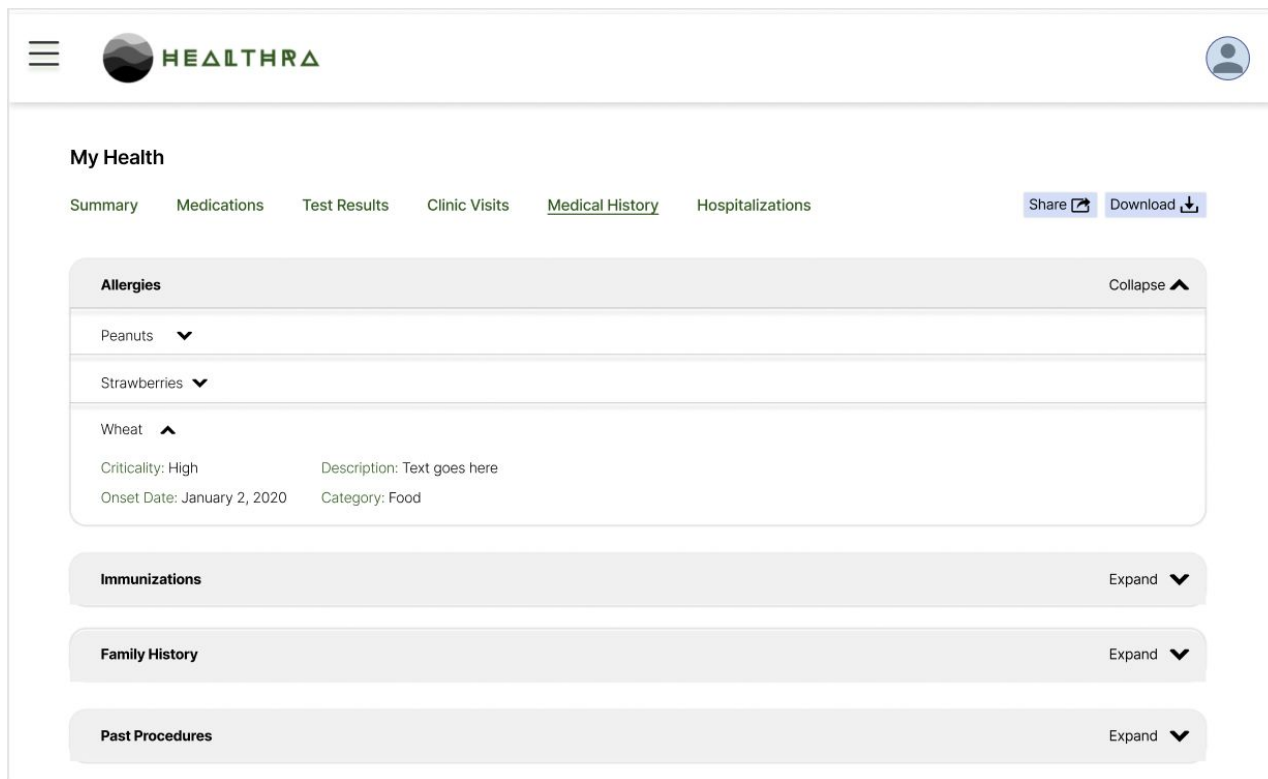
Received: Apr-04-2021

Report: Apr-05-2021

Ordered by: Dr. Lina Wang

Name	Result	Normal Range	Units	
Hemoglobin	17	11.0-16.0	g/dL	?
White Blood Cell Count	3.3	3.5-5.5	10 ⁶ /uL	?
Red Blood Cell Count	6.7	4.5 -11	10 ³ /uL	?

Design Iteration #1 – Medical History

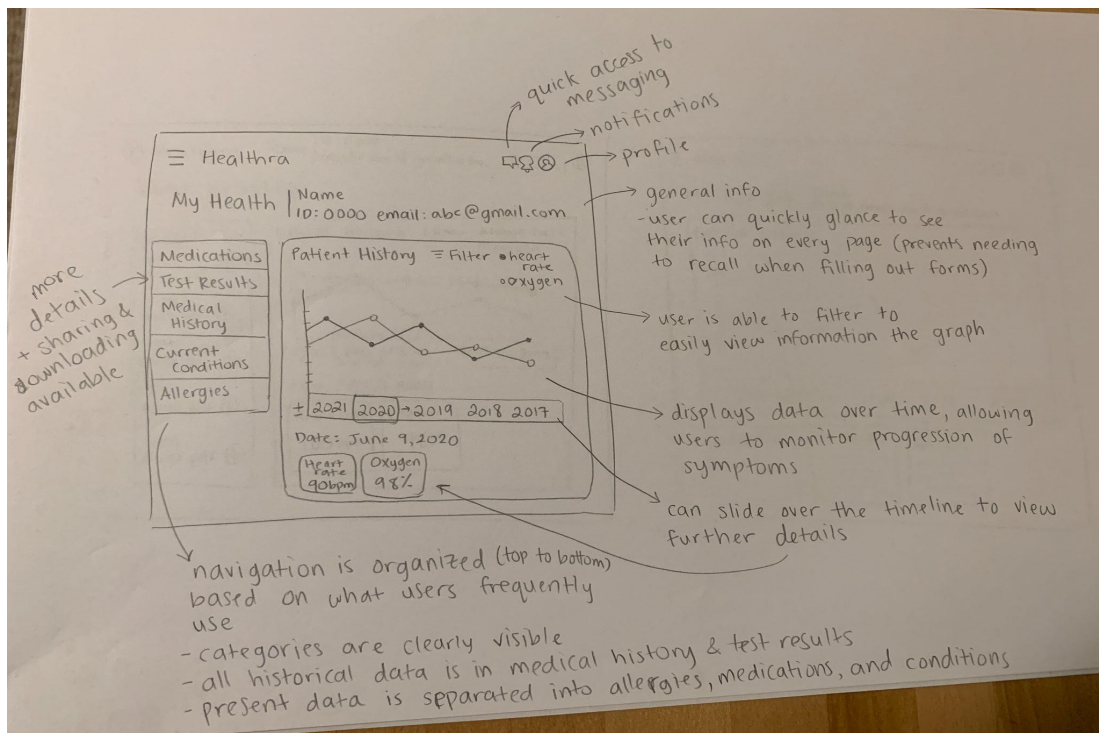


Feedback

- More visualization of data - ex. graphs
- Make heading titles clearer and easier to understand
- Reduce the number of clicks required to access data
- Want quick access to general information

Health Records Sketch #3

- Moved navigation to left
- Added a graph for more visualization and quicker access to details
- General information is constantly shown on the top - easy for user to recall info
- Navigation heading titles changed to be more understandable



Design Iteration #2

Figma Prototype

A dark blue diagonal gradient bar that starts from the bottom left and extends towards the top right, covering the lower half of the slide.



Email Address



Password

[Forgot password?](#)

Sign In

Not registered yet? [Create an account](#)



HEALTHRA



Home

First Last

ID: 0000 email: abc@gmail.com

Upcoming Appointments

+ Book

- NOV 9:30 am
30 Support Group - Dufferin Hospital
- DEC 4:00 pm
12 Follow-up - Dr. Ellen Martin
- JAN 9:30 am
06 Checkup - Dr. Shivani Shahid

View All >

Care Team

Dr. Shivani Shahid
Family Physician



Dr. Ellen Martin
Clinical Psychologist



Theresa Wayne
Therapist



James Gordon
Dietitian



View All >

Emergency Resources

Life-Threatening Emergency
911

Mary Bloom 
416-555-5555

24/7 Mental Health Crisis Helpline
905-278-9036
1-888-811-2222

Crisis Services Canada
1-833-456-4566

Caledon Hospital
905-555-5555

Interim Shelter
905-403-0864

Medications

- Levothyroxine 2 refills remaining **Refill**
- Advair Diskus 3 refills remaining **Refill**

View All >

Test Results

- Blood CBC Report Jul-02-2021 
- Urine Report Jun-09-2021 

View All >



Health Records



Trends



Medications



Test Results



Current Conditions



Allergies



Medical History



Appointments



Care Plan

mail.com

ts



+ Book

ospital

id

View All >

Care Team



Dr. Shivani Shahid
Family Physician



Dr. Ellen Martin
Clinical Psychologist



Theresa Wayne
Therapist



James Gordon
Dietitian



View All >

Emergency Resources



Life-Threatening Emergency
911

Mary Bloom 
416-555-5555

24/7 Mental Health Crisis Helpline
905-278-9036
1-888-811-2222

Crisis Services Canada
1-833-456-4566

Caledon Hospital
905-555-5555

Interim Shelter
905-403-0864

Test Results



Blood CBC Report Jul-02-2021



Urine Report Jun-09-2021



View All >

ing

Refill

ing

Refill

View All >



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Health Records

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Trends

Medications

Test Results

Current Conditions

Allergies

Medical History

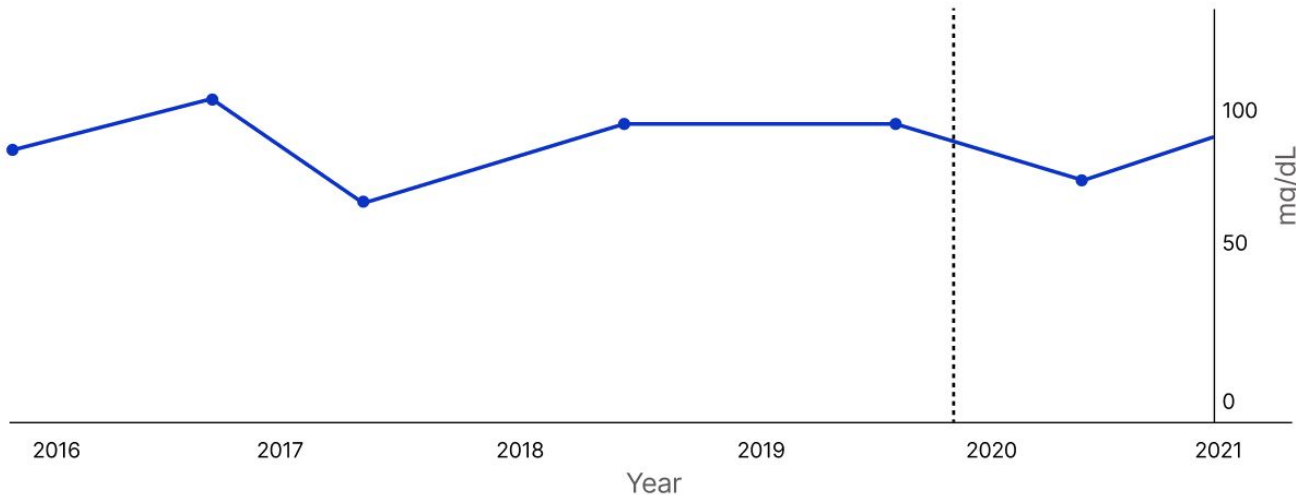
Trends

Glucose ▼

All Time ▼

96 mg/dL

Dec 15, 2020





Health Records

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Trends

Medications

Test Results

Current Conditions

Allergies

Medical History

Trends

Glucose ^

All Time v

Vitals ?

Blood Pressure

Heart Rate

Respiration Rate

Temperature

Height

Weight

Complete Blood Count (CBC) ?

Red Blood Cell Count

White Blood Cell Count

Platelet Count

Hemoglobin

Hematocrit

Basic Metabolic Panel (BMP) ?

Glucose

Calcium

Creatinine

Potassium

Sodium

Carbon Dioxide (Bicarbonate)



2016

2017

2018

2019

2020

2021

Year

0



Health Records

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ID: 0000 email: abc@gmail.com

Trends

Medications

Test Results

Current Conditions

Allergies

Medical History

Medications



Search

Filter

<input type="checkbox"/>	Name ▲	Directions ▼	Refills ▼	Dosage ▼	Quantity ▼	Prescribed by ▼	Prescribed ▼	Status ▼
<input type="checkbox"/>	Medication 1	2 tablets/day	2	20 mg	70	Dr. Theresa Wayne	Jul-02-2021	Active
<input checked="" type="checkbox"/>	Medication 2	1 tablet/day	3	30 mg	90	Dr. Ellen Martin	Aug-01-2021	Active
<input type="checkbox"/>	Medication 3	1 tablet/day	3	20 mg	20	Dr. Shivani Shahid	Mar-02-2021	Active
<input type="checkbox"/>	Medication 4	2 tablets/day	1	50 mg	100	Dr. Theresa Wayne	Jun-09-2021	Active
<input checked="" type="checkbox"/>	Medication 5	2 tablets/day	-	70 mg	80	Dr. Shivani Shahid	Nov-02-2020	Inactive
<input type="checkbox"/>	Medication 6	2 tablets/day	2	20 mg	40	Dr. Daniel King	Jul-02-2020	Active

Refill

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Trends

Medications

Test Results

Current Conditions

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Medical History

Test Results



Filter

<input type="checkbox"/>	Name ▾	Collection Date ▲	Category ▾	Ordered by ▾	Lab ▾	Result ▾
<input type="checkbox"/>	Blood (CBC)	Jul-02-2021	Hemotology	Dr. Theresa Wayne	Dufferin Lab	✓
<input type="checkbox"/>	Glucose	Aug-01-2020	Biochemistry	Dr. Ellen Martin	LifeLabs	!
<input type="checkbox"/>	B12	Mar-02-2020	Hematology	Dr. Shivani Shahid	LifeLabs	✓
<input type="checkbox"/>	CT Scan	Jun-09-2019	CAT Scan	Dr. Theresa Wayne	LifeLabs	✓
<input type="checkbox"/>	Potassium	Nov-02-2018	Biochemistry	Dr. Shivani Shahid	Caledon Lab	✓
<input type="checkbox"/>	HbA1C	Jul-02-2018	Biochemistry	Dr. Daniel King	LifeLabs	✓

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Trends

Medications

Test Results

Current Conditions

Allergies

Medical History

Blood CBC Report - Ref ID 274738

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Dufferin Lab | 423 East Street, L4F 0M4 | (123) 456-7890

Name: First Last

Age: 22

Patient ID: 0000

Sex: Male

Order Date: Jun-02-2021

Received: Jul-04-2021

Collection Date: Jul-02-2021

Report: Jul-05-2021

Ordered by: Dr. Theresa Wayne

Name	Result	Normal Range	Units	
Hemoglobin	17	11.0 - 16.0	g/dL	
Red Blood Cell Count	3.3	3.5 - 5.50	10 ⁶ /uL	
White Blood Cell Count	6.7	4.5 - 11	10 ³ /uL	



Health Records

First Last

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Trends

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Current Conditions

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Medical History

Current Conditions



Search

Filter

<input type="checkbox"/>	Name ▼	Severity ▼	Recorded by ▼	Onset Date ▼
<input type="checkbox"/>	Depression	Mild	Dr. Ellen Jones	Jul-03-2021
<input type="checkbox"/>	Anxiety Disorder of Childhood	Mild	Mindy Bloom	Aug-03-2021
<input type="checkbox"/>	High Blood Pressure	Mild	Dr. James Brown	Mar-04-2021
<input type="checkbox"/>	Eating Disorder	Moderate	Dr. Emma Yang	Jun-10-2021
<input type="checkbox"/>	PTSD	Severe	Logan Carlsen	Nov-03-2020
<input type="checkbox"/>	Diabetes	Mild	Anish Giri	Jul-04-2020

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Allergies

Medical History

Allergies



Search

Filter

<input type="checkbox"/>	Name ▼	Criticality ▼	Category ▼	Type ▼	Onset Date ▼	Status ▼
<input type="checkbox"/>	Strawberries	Low	Food	Allergy	Jul-03-2021	Active
<input type="checkbox"/>	Walnuts	Low	Food	Intolerance	Aug-03-2021	Active
<input type="checkbox"/>	Acetaminophen	High	Medication	Allergy	Mar-04-2021	Active
<input type="checkbox"/>	House Dust	Unable to Assess	Environment	Allergy	Jun-10-2021	Inactive
<input type="checkbox"/>	Peanuts	Low	Biological	Allergy	Nov-03-2020	Active
<input type="checkbox"/>	Morphinan Opioid	Low	Medication	Allergy	Jul-04-2020	Active

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Trends

Medications

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Current Conditions

Allergies

Medical History

Medical History

Immunizations

Family History

Past Procedures

Past Illnesses



Search

Filter

<input type="checkbox"/>	Vaccine ▾	Type ▾	Doses Received ▾	Administered by ▾	Administered ▾
<input type="checkbox"/>	Influenza	High dose seasonal	2	Dr. Ellen Jones	Jul-03-2021
<input type="checkbox"/>	Hepatitis A	Pediatric	1	Mindy Bloom	Aug-03-2021
<input type="checkbox"/>	Hepatitis B	Adult	1	Dr. James Brown	Mar-04-2021
<input type="checkbox"/>	Cholera	Unspecified formulation	2	Dr. Emma Yang	Jun-10-2021
<input type="checkbox"/>	Adenovirus	Type 4	1	Logan Carlsen	Nov-03-2020
<input type="checkbox"/>	Polio	Unspecified formulation	2	Anish Giri	Jul-04-2020

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Past Procedures

Past Illnesses



Search



Filter

<input type="checkbox"/>	Condition ▼	Member Name ▼	Relationship ▼	Age at Diagnosis ▼
<input type="checkbox"/>	Migraine	Jane Doe	Mother	22
<input type="checkbox"/>	Diabetes	John Doe Sr.	Paternal Grandfather	15
<input type="checkbox"/>	Transient hypothyroidism	Joshua Green	Maternal Grandfather	34
<input type="checkbox"/>	Brain damage	Jerry Doe	Father	22
<input type="checkbox"/>	Osteopetrosis	Hannah Doe	Paternal Grandmother	45
<input type="checkbox"/>	Apneic	Flora Green	Maternal Grandmother	27

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Past Prodecures

Past Illnesses



Search

Filter

<input type="checkbox"/>	Name ▾	Category ▾	Location ▾	Performed by ▾	Performed ▾
<input type="checkbox"/>	Liver operation	Surgical Procedure	Dufferin Hospital	Dr. Ellen Jones	Jul-03-2021
<input type="checkbox"/>	Transfusion	Surgical Procedure	Caledon Hospital	Dr. Mindy Bloom	Aug-03-2021
<input type="checkbox"/>	Operative procedure on knee	Surgical Procedure	Caledon Hospital	Dr. James Brown	Mar-04-2021
<input type="checkbox"/>	Psychologic Test	Psychiatry Procedure	Dufferin Hospital	Dr. Emma Yang	Jun-10-2021
<input type="checkbox"/>	Repair of Blood Vessel	Surgical Procedure	Caledon Hospital	Dr. Logan Carlsen	Nov-03-2020
<input type="checkbox"/>	Cornea Procedure	Surgical Procedure	Dufferin Hospital	Dr. Anish Giri	Jul-04-2020

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Family History

Past Prodecures

Past Illnesses



Search

Filter

<input type="checkbox"/>	Name ▼	Severity ▼	Recorded by ▼	Onset Date ▼
<input type="checkbox"/>	Pneumonia	Mild	Dr. Ellen Jones	Jul-03-2021
<input type="checkbox"/>	Pink Eye	Mild	Dr. Mindy Bloom	Aug-03-2021
<input type="checkbox"/>	Sinus Infection	Mild	Dr. James Brown	Mar-04-2021
<input type="checkbox"/>	Mononucleosis	Moderate	Dr. Emma Yang	Jun-10-2021
<input type="checkbox"/>	Urinary Tract Infection	Severe	Dr. Logan Carlsen	Nov-03-2020
<input type="checkbox"/>	Tuberculosis	Mild	Dr. Anish Giri	Jul-04-2020

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