



Hypothesis

Telemedicine--the virtual and online practise of healthcare--, which many doctors have been forced to implement due to COVID19, can be very efficient and convenient for treating certain ailments and patients but also posses many difficulties depending on the patient or health issue being dealt with.

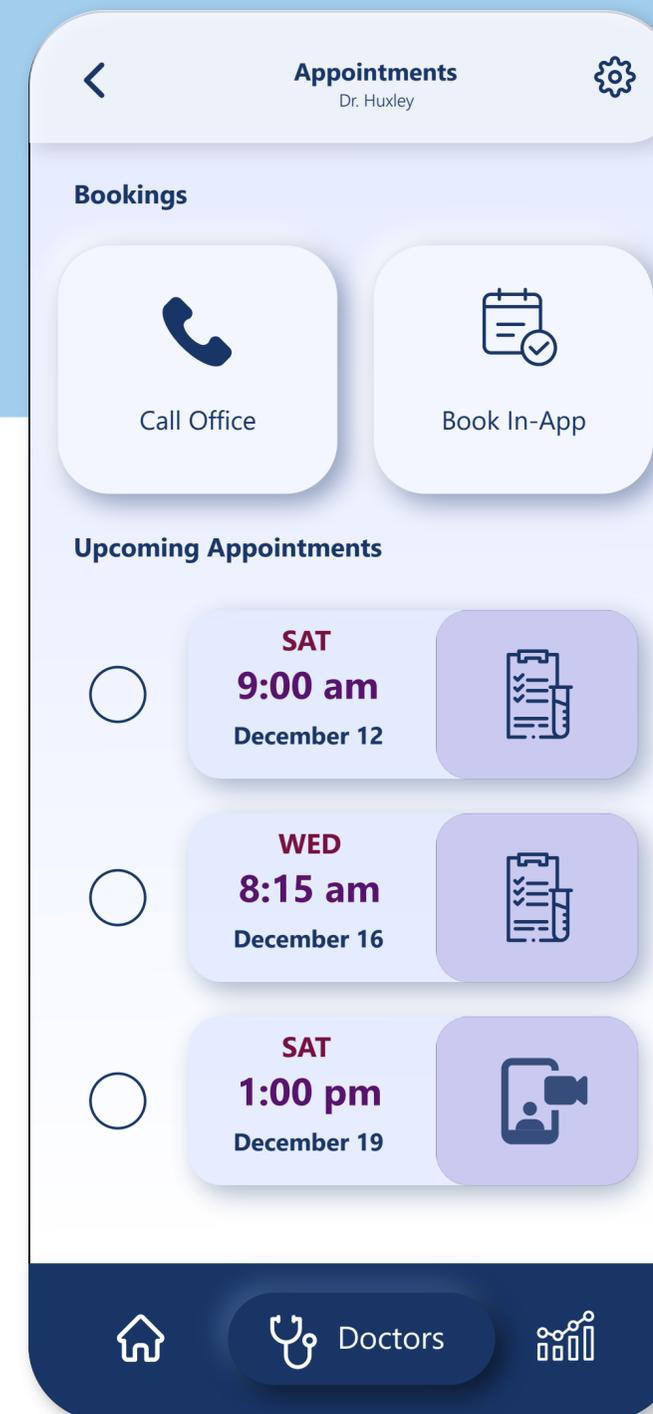
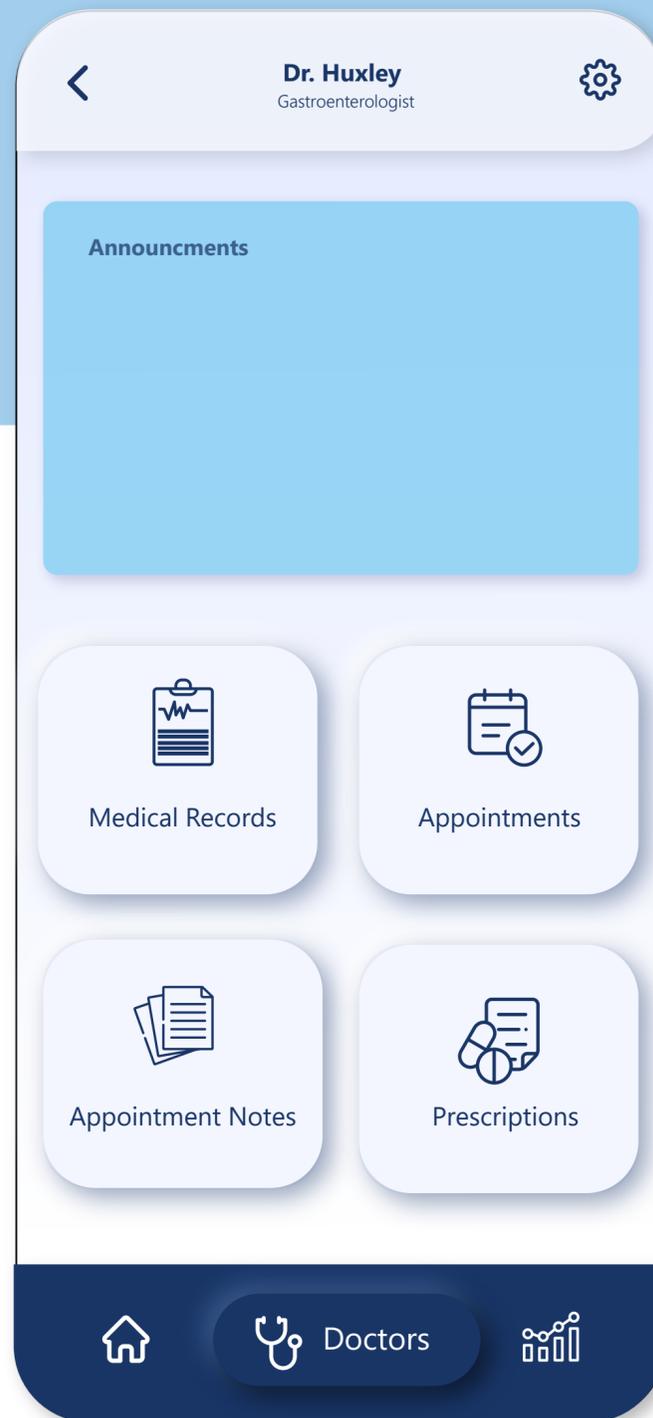
How Might We...

How might we improve patient-physician communication with telemedicine so that difficult diagnoses and treatments are more easily handled

How might we integrate the advantages of telemedicine into the current Ontario(or Canadian) healthcare system to improve speed while maintaining quality care.



Ontario Health





**Ontario
Health**

Value Proposition

The Ontario Healthcare App brings clarity and simplicity to a patient's treatment process, by acting as a hub for all of their medical information. The consolidation and organization of a patient's healthcare information helps facilitate a calmer and smoother treatment process, while also lending itself to a sense of transparency and agency on the part of the patient, which in turn elevates trust and confidence in the medical practitioner; thus, a better communication and relationship between patient and doctor is facilitated as a consequence of the increased efficiency and clarity provided by the app.

Scenario

Charlie Zackman is an owner of a small contracting business capable of a variety of different household renovation work. While on the job, Charlie's been experiencing some minor health concerns and would benefit from some medical attention. Charlie's wife encourages him to see their family doctor, Dr. Huxley. Because of COVID19, Huxley is having most of his appointments virtual as phone or video calls. Charlie and Huxley have a number of video appointments over zoom over the course of the next few weeks to try and solve Charlie's health issues. Challenges arise as the number of appointments, tests and doctors Charlie is required to manage multiply greatly: he isn't particularly motivated or confident in the process.

Persona:



Charlie "Chap" Zackman

Age: 36

Sex: Male

Ethnicity: Scottish

Occupation: Construction; Freelance Contracting

Deck construction

Hear

wife: "Sweetie, you need to trust Dr Huxley, he is a professional"
"try this for a week and keep an eye on your symptoms"
"Bad Side effects"
"COVID COVID COVID Up UPuPupUp"
"western medicine is turning people into Pill-popping zombies"
"This diet fixes that ailment"

Think/Feel

-I'm not sure Huxley is able to be as effective over zoom
-For short appointment check-ins, video calls are convenient
-I wish I could go in person on occasion at least
-There's a sense of reciprocal understanding that is missing from virtual meetings. I feel distant.
-How will I keep my business running if my health continues to worsen?
-I'd like to see a different type of doctor maybe?
-Light headed out of breath, weak
-I'm not sure it's cardiovascular like Huxley is asserting
-I can't risk getting COVID
-I'm not sure I trust modern medicine
-I want to take my health into my own hands

Do/Say

"I'm going to have to take a break"
"I might have to leave you [workcrew] guys for today I'm not feeling my best"
-Charlie will go and research symptoms online
-"I wonder if what I'm feeling is really that serious. It may just go away with time."
-"I don't want to take medication without confidence that I need it for what I've got"
-"I don't want to get worse, but I don't know if this is helping. Maybe I should wait till after COVID"
-to wife: "I want to ask Huxley to get my testosterone checked. Am I allowed to just ask for a test?"
-"It doesn't feel that serious maybe it something to do with what I'm eating, if I could just fix that..."
- "I want to get to the fundamental problem. I don't want to just treat symptoms"

See

-Zoom calls with Doctor
-Worksites
-His kids and wife
-Medical website forums
- Men's health websites and forums
-Diet and nutrition websites
-His young healthy work-crew having an easy time
-news filled with COVID fear

Gains

-Some more Control (or at least the feeling of it)
-Perspective and understanding of decision making
-Greater transparency
-More efficient communication
-Better relationship with Doctor

Pains

-Nervous about the effectiveness of virtual medicine.
-Worried he may be led on the wrong path of recovery
-Feels out of control of the process
-

Persona:



Dr. Huxley
Age: 51
Sex: Male
Ethnicity: British
Occupation: Family Physician

Hear

- "okay that sounds good"
- "I'm doing alright I think things are better"
- "can I get a refill on my prescription?"
- "I think I know what I've got. I looked it up online"
- "I want to get to the root of the issue"
- "do you think it's COVID"
- "I'm concerned about the side effects, is there not a different option?"

Think/Feel

- I've got a lot more time on my hands than usual
- It's concerning that so many patients are foregoing check ups and appointments because of COVID fears.
- Phone appointments are turning out to be very efficient for some patients.
- There are patients I'd like to see in person but it seems unwise since it's not an emergency per se.
- I feel conflicted sending patients to testing facilities in hospitals because they risk COVID exposure.
- "I might be able to open for walk-in calls or take on some new patients while this is still going on"
- some of my patients seem not to trust my judgement

Do/Say

- "The last thing any physician wants is to be the source of a community spread event"
- "If we aren't able to protect our staff and ourselves and our patients from each other, then we don't reopen"
- "hard to tell how patients are feeling through video or over phone"
- "I want a reciprocal relationship with my patients for those who have milder issues with many options for treatment, however some patients conditions don't lend well to a reciprocal approach: I feel they have to trust me fully or else I can't be effective"

See

- Patient's on zoom meetings
- Patient Medical Information
- Office Staff
- Stressed supply lines PPE becoming limited
- Less Patients than usual
- Some patients hesitant to take prescription drugs
- Something different about the average person
- Trend towards skepticism of pharmaceuticals

Gains

- Greater confidence in practice
- Smoother communications
- Easier communications
- Better patient co-operation
- Greater patient enthusiasm

Pains

- Struggling with patients who don't trust the process
- Feeling limited by COVID
- Can't guarantee same quality care as before. Feels guilty for it
- Patients are in a worse mood too due to virus it limitations etc,

User journey: healthcare during COVID

User Phases	Symptoms	Doctor Appointment	Diagnostics	Results	Initial Treatment	Diagnosis Prescription
Interation	<p>Charlie is experiencing mild fatigue, light headedness and reduced energy and focus on the job. He decides he needs to see his doctor about it. Charlie calls the doctors office to make an appointment; expecting to be able to go into the office Charlie is told appointments are online and is given a time for a zoom meeting.</p>	<p>Huxley and Charlie meet over zoom at the agreed upon time. Huxley begins a series of medical questions and some at-home tests before determining that Charlie must go for blood work and an ultra sound.</p>	<p>Charlie goes to his test appointments and has his tests done. He then waits for the results to come back in at such time Huxleys office calls him to schedule a zoom appointment.</p>	<p>Huxley and Charlie meet again to discuss results. Huxley says Charlie has low blood iron or anemia he prescribes him an iron supplement. More medical questions are asked, and Huxley recommends another set of tests pertaining to digestive health as a possible issue. Charlie is told he will need to check in and be tested regularly for a few months over his iron deficiency.</p>	<p>Charlie attends tests for his digestion and begins his supplementation of iron. His symptoms do not improve in the first week. Huxley and Charlie meet again with results for digestive issues which confirm Charlie is suffering from an inflammatory bowel condition possibly causing malnutrition. He sends him for more bloodwork to test certain nutritional markers</p>	<p>Charlie is improving slightly on the iron supp while he meets for another appointment 1.5 weeks later where Huxley confirms his suspicion of inflammatory bowel dieses causing mal nutrition.</p> <p>Charlie is prescribed a number of supplements and is referred to a gastroenterologist by Huxley and is recommended to see a nutritionist if he has the means</p>
Charlie Needs/Wants	<p>Needs to fix his health problems so that he can work and live at full capacity. He want somebody or some way to comfort his concerns about his symptoms.</p>	<p>Wants to understand the decision making Wants to hear confidence Must download and figure out Zoom</p>	<p>Needs to remember his appointments and organize getting there on time</p> <p>Wants speedy results Wants to have access to his results Does not want COVID</p>	<p>The speed at which things are diagnosed is rattling. Wants to know if iron has side effects.</p> <p>The realization that something is actually wrong.</p>	<p>wants to have access to test results wants to see improvement quickly Upset that the issue is more complicated and will take much time to fix</p>	<p>Charlie has an increasing number of appointments which he must remember to attend and schedule around life wants to know side effects</p>
Design Objectives	<p>Speed Confidence</p>	<p>Show progression to facilitate understanding and trust</p> <p>Break the ice</p>	<p>Ease of scheduling Test appointment accommodation</p>	<p>Promote a sense of control Notes for reasoning and communication</p>	<p>Medical data accessible Project a recovery path Be Encouraging Fun Gamification</p>	<p>Supports routine Visualize schedule Prescription information Act as hub for all of an individual's healthcare professionals</p>
Dr. Huxley Need/Wants	<p>Huxley needs to preform healthcare remotely because of the pandemic. Doesn't want his practise to shut down. He wants to be able to give healthcare effectively, to help his patients health improve</p>	<p>Needs Charlie to go to appointments to continue treating him. Wants trust and good communication, smoothness</p>	<p>Needs Charlie to get tests</p>	<p>Hard to give bad news And want trust and good communication at same time.</p>	<p>Want to stay on track and keep morale high in face of bad news. Establish beginning of routine: and for Charlie to take responsibility for himself realize he has to accept this health issue as part of his life.</p>	<p>Wants to feel confident Charlie is following through with the specialists and the rest of the treatment plan</p> <p>Want him to take his meds</p>
Design Objectives	<p>Support fully-online telemedicine</p>	<p>Communication efficiency Routine and trust</p>	<p>Incentive to cooperate</p>	<p>patience</p>	<p>Establish that condition is normal and that it has been overcome and is beatable</p>	<p>Establish routine Highlight positive</p>
Tensions/Conflict	<p>Charlie is skeptical of the effectiveness of virtual healthcare while Huxley needs his trust and confidence</p>			<p>Charlie is hesitant to take prescription medication</p>		<p>Charlie demoralized by the demands of his ailment doctors need his cooperation</p>

Design Objectives

Must

- Easy Appointment Scheduling
- Remind and organize appointments
- Support a routine
- Track progress of treatment or key markers related to condition: visualize improvement
- Encourage doctor-patient engagement
- Simplify the problem
- Support multiple doctors/specialists at once
- Adhere to COVID restrictions

Should

- Track prescriptions
- Give more control to patient
- Be something you interact with regularly
- Organize a medical history archive

Could

- Help patient find a doctor
- Support medical and other healthcare professionals not covered by OHIP

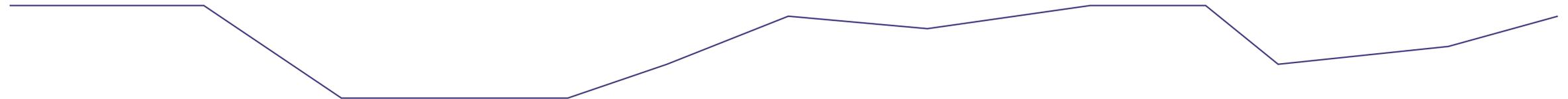
Building Value: User Journey after COVID:

Scenario: Charlie is experiencing concerning symptoms on the job a year after COVID has ended and telemedicine is no longer an option.

User Phases



Emotion



Context

Charlie is experiencing fatigue, light headedness and reduced energy and focus on the job. He decides he needs to see his doctor about it. Charlie's family doctor lives an hour away in his home town. He considers looking for a doctor taking patients in his area but it seems like a lot of work and it hars to find a good doctor he feels he can trust

Charlie decides to go to his family Doctor out of town. He is able to get an appointment 3 days later. At his appointment his doctor determines he needs some bloodwork and schedules an ultrasound.

Charlie gets his bloodwork done the next day and attends his ultrasound appointment the following week. A week after this, Charlie schedules another appointment with his doctor, to go over the results.

At the appointment Charlie is told that his test results show no abnormality. Yet Charlie's symptoms continue. his doctor recommends another set of tests; he has these done and, in the same manner as before, makes an appointment to go over results.

This time its is determined that Charlie's symptoms are being caused by low Testosterone and poor nutrition. Charlie is prescribed medication and is referred to a nutritionist. Charlie is required to have regular bloodwork to monitor his progress, which he must meet with each doctor about.

Analysis/ Pain Point

Charlie needs to decide whether to go to a walk-in clinic or his family doctor. The hourlong drive is not helping to motivate him to get help.

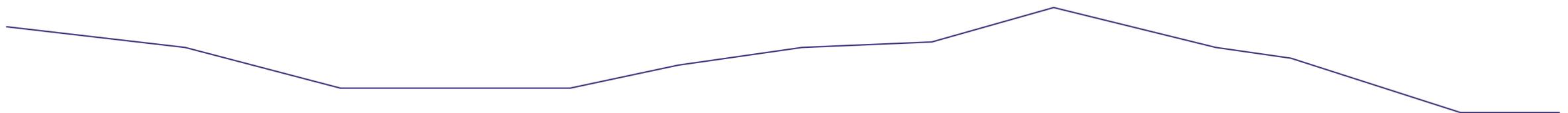
Charlie's symptom's persist while he waits his turn to see his doctor. He feels somewhat calmer and hopeful, having 2 tests scheduled.

Takes a long time for results to be reviewed. Charlie wishes to see his results sooner but cannot without doctor appointment

Charlie must drive out an hour for every appointment. Bill feels demoralized: like no progress made despite two weeks of appointments. All the while his symptoms still have negative effects

Having figured out his issue, Charlie is relieved yet the contrived nature of constant 2min check-in appointments begin to annoy him as his treatment goes on.

Emotion Using App



Context Using App

Charlie is experiencing fatigue, light headedness and reduced energy and focus on the job. He decides he needs to see his doctor about it. Charlie's family doctor lives an hour away in his home town. Charlie uses the Ontario Healthcare app to schedule an online appointment with his family doctor so he doesn't have to make a long drive

He is able to schedule an appointment for 3 days later using the app. During the video call appointment he answers a number of questions and is sent for some initial bloodwork and is also scheduled for an ultrasound. The ultra sound appointment time and location are sent to he through the app.

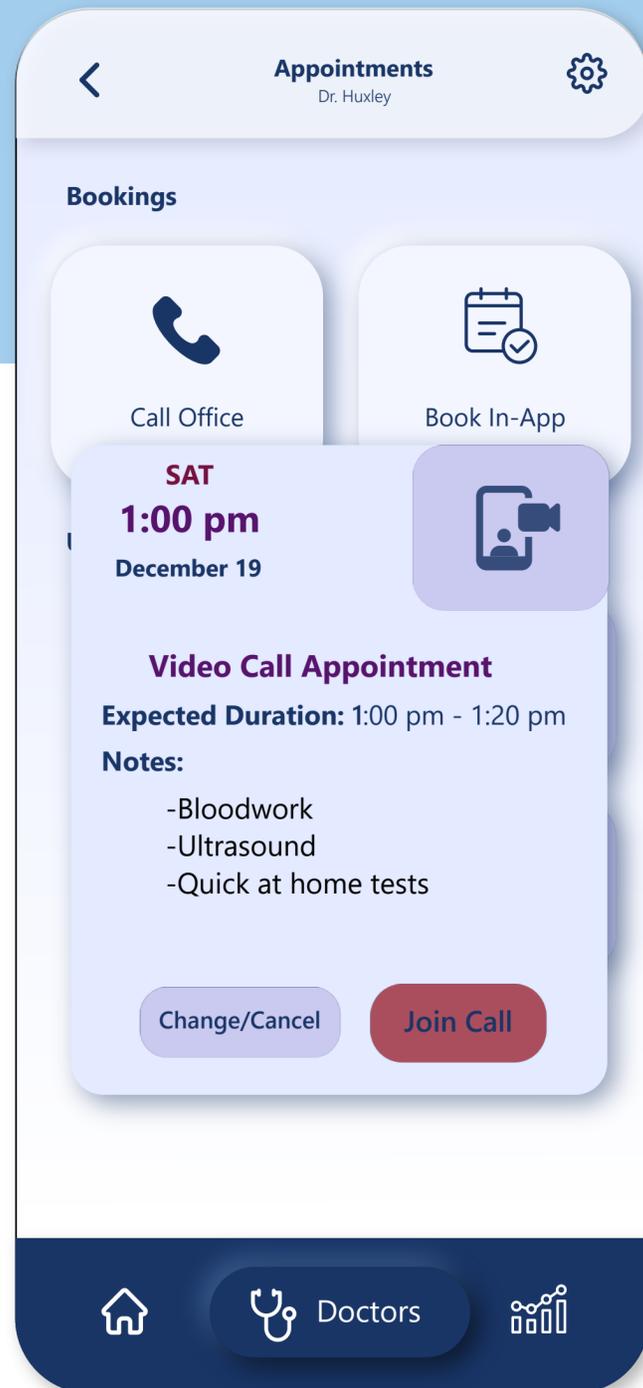
Charlie gets his bloodwork done the next day and attends his ultrasound appointment the following week. Soon after, he receives his results through the Ontario Healthcare app. Charlie's doctor has left an note on in the app saying the results are inconclusive and another appointment will have to be made.

Charlie's next appointment is over the phone through the Ontario Healthcare app. His Doctor wished to quickly revisit his symptoms before having him do a few more tests. Charlie has these tests scheduled through the app and after completing them the results are filed within his medical data, accessible within the app. Right after the results come in, Charlie's doctor schedules another call through the app. In the call he diagnoses Charlie with low Testosterone levels and some nutritional deficiencies. He is prescribed medication and supplements referred to a nutritionist.

Charlie's nutritionist appears in the specialists tab within the app and he schedules an appointment. Meanwhile Charlie is required to have regular bloodwork to monitor his progress on his medication. Each month his bloodwork results are sent to him within the app and his doctor leaves a note or requests a call to review and check-in on Charlie's symptoms/progress.

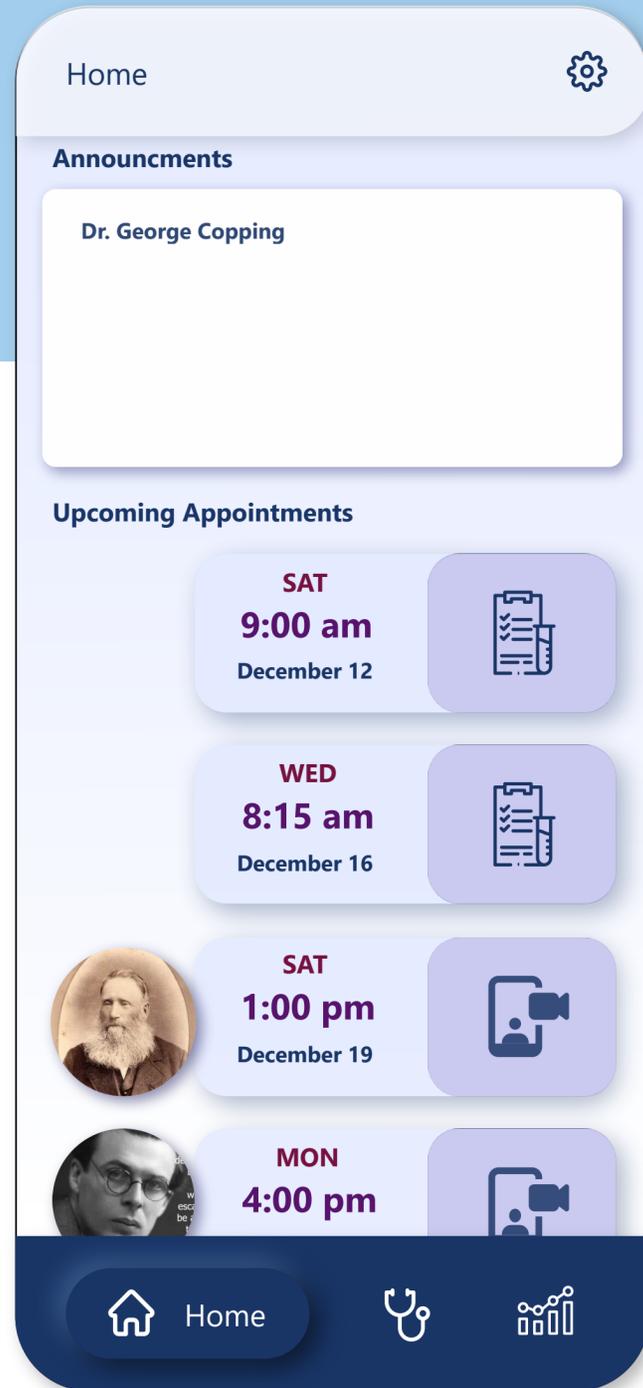
Insights on Canadian Health Care:

1. Long wait times for appointments.
2. Not in control of your own information or medical data, yet you are responsible for your own health.
3. Must see your physician in person to see the results of any test you have done because phone calls cannot be billed to Gov.
4. Difficult to find family physician: many must rely on walk-in clinics.
5. Because all tests and services are controlled and payed for by the government, Canadians cannot get any test they think they may need at any time; in most cases the doctor must approve it first. Tests covered by the government cannot be payed for independently: the only way to get a test is to get in line after doctor approves.
6. Every Canadian's healthcare data is stored in provincial government database



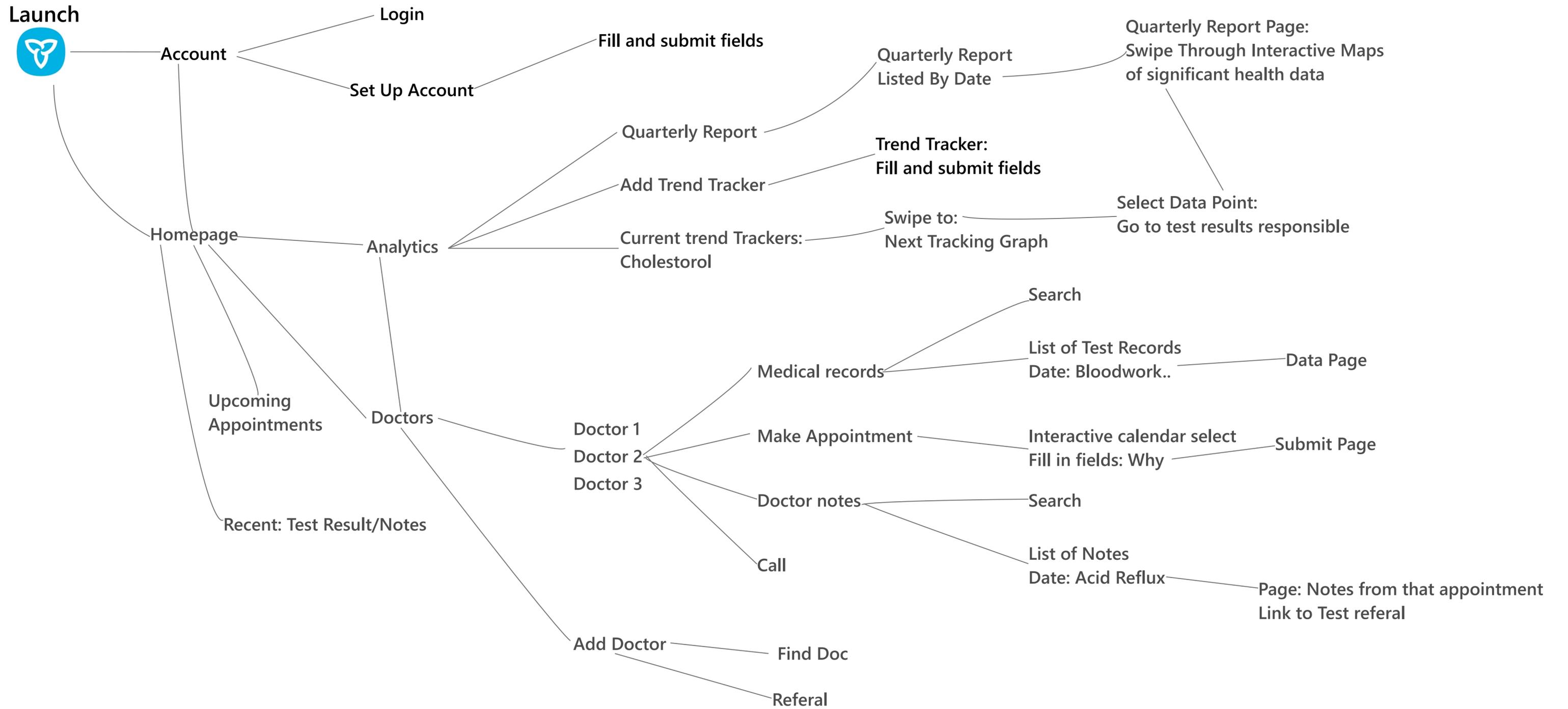
Value Proposition

This app's integration into the current Ontario healthcare system as a consequence of COVID could serve as a valuable asset in improving healthcare beyond the scope of COVID-related challenges. For instance, because this app would require government oversight in order to function, it follows that the restriction of all tele-medical activity to one app would allow governments to easily monitor billing and appointment lengths thereby allowing physicians to continue to meet patients for virtual appointments after COVID. There are many scenarios in which virtual appointments are the more effective and much more suitable option to meeting in-office, so the continued authorization of telemedicine would certainly increase efficiency, reduce wait times, and potentially allow doctors to handle greater patient numbers.



Prototype Demo

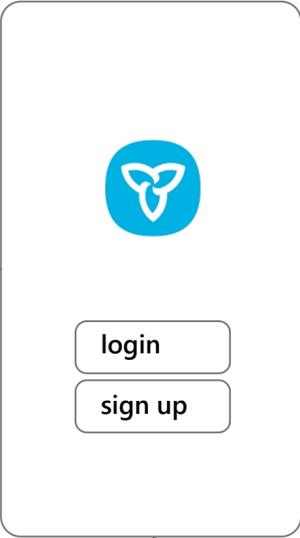
https://www.youtube.com/watch?v=CF_7vomQ6SU



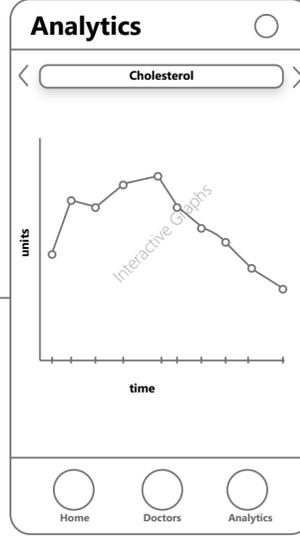
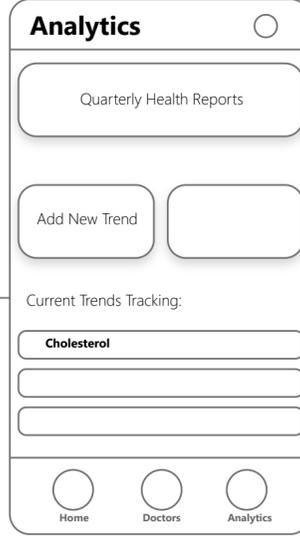
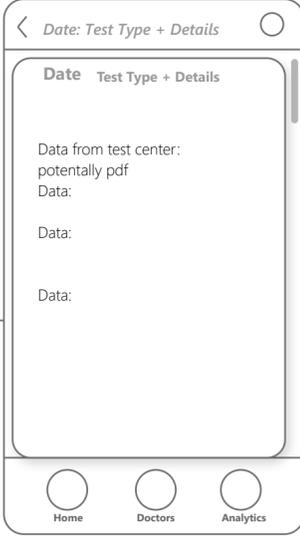
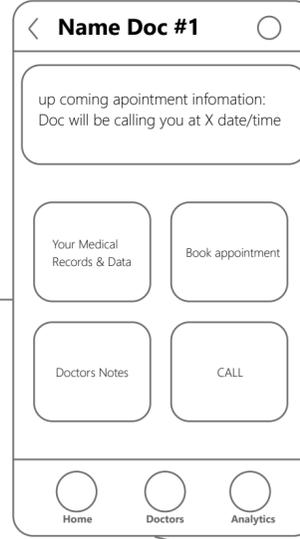
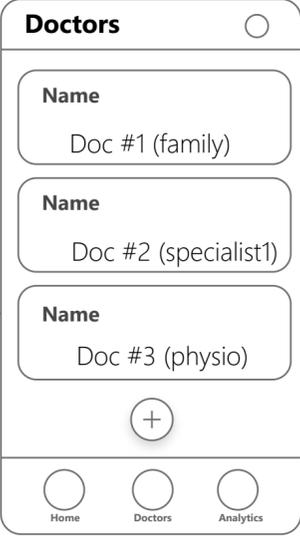
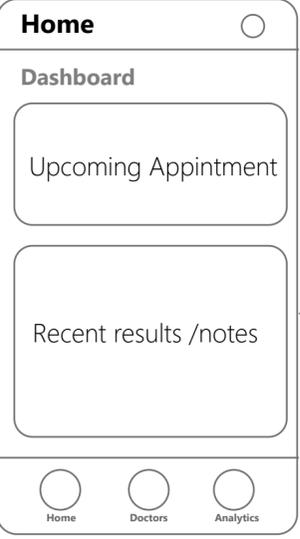
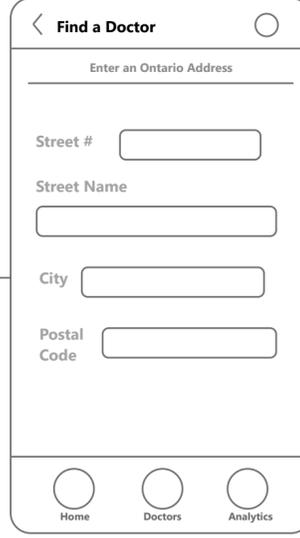
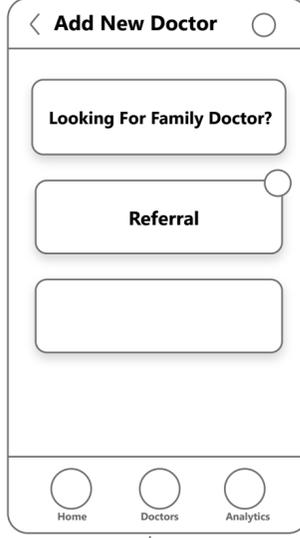
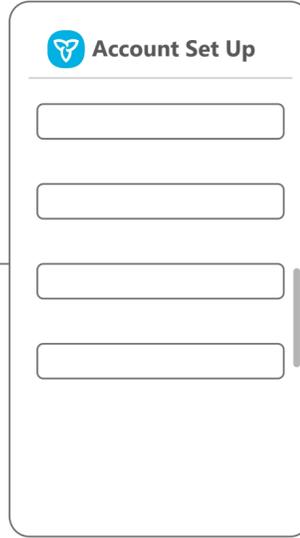
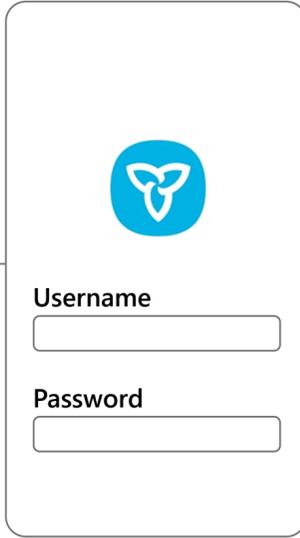
Opening Screen



Account Option



Login



References

Pfeffer, A. (2020, July 28). Virtual visits with Ontario family doctors to remain the norm, for now | CBC News. Retrieved December 15, 2020, from <https://www.cbc.ca/news/canada/ottawa/family-doctors-virtual-visits-1.5664520>

Alberta Health Services. (2020, May 11). COVID-19 Scientific Advisory Group Rapid Evidence Report. Retrieved from <https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-sag-virtual-vs-in-person-care-rapid-review.pdf>

Donelan, Karen et al. "Patient and clinician experiences with telehealth for patient follow-up care." *The American journal of managed care* vol. 25,1 (2019): 40-44.

Kashgary, Abdullah, et al. "The Role of Mobile Devices in Doctor-Patient Communication: A Systematic Review and Meta-Analysis." *Journal of Telemedicine and Telecare*, vol. 23, no. 8, Sept. 2017, pp. 693–700, doi:10.1177/1357633X16661604.

Stahl, James E, and Ronald F Dixon. "Acceptability and willingness to pay for primary care videoconferencing: a randomized controlled trial." *Journal of telemedicine and telecare* vol. 16,3 (2010): 147-51. doi:10.1258/jtt.2009.090502

Lem, M. (2020, May 04). A doctor's advice for how to get the most out of your virtual health appointment | CBC Life. Retrieved December 15, 2020, from <https://www.cbc.ca/life/wellness/a-doctor-s-advice-for-how-to-get-the-most-out-of-your-virtual-health-appointment-1.5554641>