GREEN CIRCLE HEALTH PROPOSAL

CONSUMER HEALTH DATA AGGREGATOR CHALLENGE

Abstract

This document explains the solution proposed by Green Circle Health in response to the ONC Consumer Health Data Aggregator Challenge.

www.greencirclehealth.com

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1 INTRODUCTION

In March of 2016 the Department of Health and Human Services issued a Challenge to Consumer Health Data Aggregators to spur innovations. Green Circle Health, a startup company, wishes to participate in the challenge to solve the problem for consumers to aggregate medical data from disparate sources and not only make it easy for patients to get their own medical records from healthcare providers but also make it easy to organize such medical records for themselves and their family members. GCH sees an opportunity to make this medical data even more useful by allowing users to augment such records with other documents that they may have collected from other sources as well as with vitals data available from their personal home medical devices and activity trackers. Using such data patients now can not only get better understanding of their own health, but can also develop care management plans and follow treatment programs for chronic conditions. Such a system would notify them of upcoming appointments, remind for medication or immunization and alert appropriate parties when their vitals changes; all of which improves adherence to care protocol and early detection to improve prevention and deliver healthcare in the most appropriate settings. GCH sees an opportunity to build a commercially viable business in this area. This document outlines GCH proposal to build such a product and a service that will be foundation for a successful business.

1.1 Document Scope

This document explains the functional and technical specifications of the solution that Green Circle Health (GCH) is proposing to build in response to the Consumer Health Data Aggregator Challenge posted by the Department of Health and Human Services (HHS). The proposed functionality of the solution is explained in detail with the support of screenshots from an HTML prototype. The document also explains the business model and revenue and expenditure projections to justify business opportunity and viability. A list of EHR Systems implemented at

healthcare providers to which the proposed solution will connect to import patient health data is included in this document.

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1.3 Glossary

GCH	Green Circle Health
HHS	Department of Health and Human Services
ONC	Office of the National Coordinator for Health Information Technology
SHL	Simple Healthcare LLC.
HIPAA	Health Insurance Portability Accountability Act
HITECH	Health Information Technology for Economic and Clinical Health
AWS	Amazon Web Services

1.4 About Green Circle Health

Simple Healthcare is a Florida Limited Liability Company (SHL) with office in Pensacola Beach, Florida and is doing business as Green Circle Health (GCH). GCH is a health information technology provider with focus on improving healthcare outcomes and saving billions of dollars in healthcare costs by changing the paradigm of healthcare. GCH is developing an online communications gateway that enables the real-time collaborative exchange of patient vitals and

health records among physicians, patients, family members, insurers and employees. The GCH platform extends its usefulness to a person from the prenatal stage of a person's conception right through the senior years, thus becoming a complete health repository for a lifetime. GCH will take advantage of FHIR protocol to help patient gather personal records from health systems, making it easier to maintain such life long history. GCH will implement the necessary software for this challenge and build a business using this new workflow to facilitate the collaborative sharing of data and enhance health care providers' ability to proactively monitor, diagnose and treat medical conditions. GCH has already developed parts of the frame work necessary to support this project and expects to deliver a unique value proposition as defined in this document by conclusion of this initiative.

1.5 Vision

Green Circle Health vision is to improve heath of millions of people and save billions of dollars in healthcare costs. GCH sees an opportunity to improve healthcare outcomes and lower costs by:

- Changing the paradigm of healthcare from treatment to prevention
- Bringing families at the center of health and healthcare

With the advent of digital health and the digitization of health records, we see new opportunities for better healthcare. However, there is not enough involvement of families to become responsible users of healthcare. Green Circle Health intends to build a platform, for patients and their families, to manage their health records and interact with healthcare providers and payers.

1.6 Health IT Opportunities

In the current healthcare scenario, with digitization of health records, patients are offered a patient portal by each provider to review their data. This leads to patients having too many separate accounts at various health care providers with no way for them to see all their medical

information in one place. They also cannot edit or correct any errors they may see online without going through a very labor intensive and time consuming process. On the patient side, they have many personal activity tracking and vitals monitoring devices that work with apps provided by those device vendors. However, such health vitals do not reach their healthcare providers. Though the patient in this technological age is equipped with computers, tablets and smart phones, they do not control their heath records. The home monitoring devices monitoring devices are more efficient and easier to use than those used by healthcare providers, but the data gathered at home is not meaningfully used for analysis or for providing timely care. With standardization of interface like one proposed in this Challenge, the user will be able to aggregate personal health records in one place like GCH. With the advent of Bluetooth and Wi-Fi technologies, platforms that store these patient generated data are slowly becoming available for customers/patients. It is common knowledge that better two-way communication between patients and providers with real time monitoring helps to avert life threatening situations and provides better adherence to treatment and wellness protocols. Letting the patient record and report their personal health data can also reduce the burden of data entry at hospitals, ERs and other healthcare centers. For physicians who are pressed for time and have limited capacity to see patients, prioritizing the patients who need immediate care can be very effective. Medical records and real-time vitals data can be provided by patients or their family using activity monitoring devices and personal medical devices. Earlier EHRs were mostly closed systems that were not easily accessible to patients. But with the advent of standards and methods for interoperability and exchange of medical data, it gives new hope to patients to own and manage their medical data from the comfort of their homes.

By improving data interchange and interoperability, duplication of data entry and data errors will be reduced greatly. Patients are faced with forms for personal information, medical information, review of systems and medical history every time a visit is scheduled. In many health systems, such forms cannot be sent beforehand thus increasing time and resources spent on re- reporting and recording redundant information.

Patients today resort to second opinions and expert consultations before accepting treatments or procedures that are recommended by their primary healthcare providers. Patients need to access and share their medical history data from one provider with other healthcare providers whom they consult for expert opinions or for follow up treatments. Currently, a patient does not have a platform that can aggregate their health data from multiple healthcare providers, which allows them to share that information with others whom they choose. Such a solution can save time and costs while improving the overall outcomes.

The healthcare system currently stands independent, which alienates the social aspect of communication, communities, population health and outbreaks. Other health systems catering to home care, elderly care, specialty care, surgical and ambulatory centers, and corporate wellness initiatives, occupational, behavioral and psychosomatic care are not connected. It is common knowledge that patient data does not reside in any one EHR system, but is spread across multiple systems. Pharmacies and diagnostics labs have their own systems with patients records and they are not always connected.

A patient-centric approach to prevention and care is the future of healthcare. Prevention and ongoing care coordination requires ongoing monitoring of various health vitals and conditions. A Bluetooth or Wi-Fi enabled glucometer device can automatically alert the family member or the caregiver of a person's falling blood sugar levels and a health platform that is capable to analyze the data can advise them to increase carbohydrate intake to maintain their blood sugar levels. Meanwhile in a fully integrated environment the out-of-bounds blood sugar reading can alert a caregiver who can pull up his medical history on the EHR system, look at complete medication data, see recent changes unrelated to diabetes treatment, and attend to the patient in a timely manner to prevent medical emergencies and other adverse conditions. This type of efficient care coordination requires a new platform.

1.7 Consumer Health Data Aggregator Challenge

The Office of the National Coordinator for Health Information Technology (ONC) under the Department of Health and Human Services (HHS) has announced the Consumer Health Data

Aggregator Challenge which is intended to spur the development of third-party, consumer-facing applications that use open, standardized APIs to help consumers aggregate their data in one place and under their control. This challenge will focus on solving the problem that many consumers have today – the ability to easily and electronically access their health data from different health care providers using a variety of different health IT systems.

The lack of interoperability between electronic health record (EHR) systems remains a significant barrier to the modernization of health IT. Fast Healthcare Interoperability Resources (FHIR), developed by HL7, is a standard designed to increase the liquidity of granular patient data. The FHIR API allows data to move between vendor systems at different providers and to third-party applications for direct use by consumers. The latter use case is key to enabling patients to play a more active role in managing their health. Patients' ability to seamlessly take their data with them as they move from provider to provider is one of the main goals of moving from a paper-based to an electronic health record system.

Of course, health and wellness information is not contained solely in provider systems – between wearables, sensors, smartphones, and more, a great deal of patient data is being collected by personal and at-home devices outside of clinical settings. An app that truly captures all of a consumer's health data must be able to absorb and consolidate all of this data being continuously collected, much of which is available through APIs.

The goals of the challenge are very much in line with the vision and mission of GCH. Therefore, GCH wishes to take part in this challenge and build the next generation health data aggregation platform which gives the users a comprehensive health platform to store and manage family health data for life by importing data from EHR systems implemented at their various healthcare providers and combining it with their vital measurements and other data that they collect using various health devices and activity trackers. The proposed platform would also allow them to share required health records with healthcare providers, or any other person whom they wish to share the data to improve the efficacy, efficiency and cost of all their future healthcare needs.

2 PROPOSED SOLUTION

2.1 Summary

The GCH platform is intended to solve the problem that many consumers face today – the ability to easily and electronically access their health data from different healthcare providers using different health IT systems. The GCH platform would use Fast Healthcare Interoperability Resources (FHIR) to transfer disparate patient data from various sources and then the consumers can access and control their data though GCH using any connected devices.

Patients' ability to seamlessly take their data with them as they move from provider to provider, system to system, device to device is one of the main goals of moving from a provider managed electronic health record system to a patient controlled health repository. GCH is being developed as a web application designed for access via devices with various screen sizes like PCs and laptops to tablets and smartphones. GCH will capture all of a consumer's health data from various healthcare providers, other health information systems, devices and user forms and surveys and consolidate all of this data and make it accessible for the consumers to view, use, update and share.

GCH will offer its customers a very comprehensive family health dashboard along with the ability to store health profile, which includes personal profile and demographics, emergency profile and medical history for their entire family, records of all the medications, appointments and immunization. It will connect to various health devices and activity trackers that are available in the market and automatically synchronize the data from those with GCH. GCH would also offer its users a number of wellness and disease care management programs which will use the vital data and answers to health and lifestyle related questionnaires provided by the users and help them to follow the treatment protocols prescribed by their physician and manage their health effectively and avoid emergencies and adverse conditions.

2.2 Proposed Application Features

2.2.1 GCH User-Interface Design

GCH Application is being designed to be accessed with ease from a wide range of devices like PCs and Laptops to Tablets and Smartphones with different screen sizes. The application UI will automatically adjust to fit the size of the screen.

The high-level layout of the GCH UI for devices with screen size 7” or larger is shown in the screenshot in Figure 1 below. It shows the branding and the various navigation options available for the user to access the system. For smaller screens the left navigation will become a dropdown list and top navigation will be retained. Top navigation functions of preference, account settings, help, FAQ, video tutorial, and notification are common features that are not elaborated in this document but details are available with GCH team should there be an interest to learn more about them. The features on left navigation include the Healthcare Providers that is for Aggregation challenge which we will explain first.

Figure 1: GCH User Interface Layout

The blank area in the screen is where the application functionality will be displayed based on actions selected. When the user navigates from one feature to the other, the corresponding

functionality will be displayed in the blank area, while the rest of the page layout will remain unchanged. In order to focus on the functionality, the screen shots shown in the remaining document only depicts the functionality that will be displayed in the application functionality area.

2.2.2 EHR Data Aggregation – Primary feature for Health Data Aggregator Challenge

The primary requirement of the health data aggregator challenge is the ability of the GCH platform to connect to different health IT systems implemented at various healthcare providers and aggregate all the data as specified in the 2015 Edition Common Clinical Data Set. User will access this function from the Patient/Consumer dashboard which is described later in this section.

From work flow point of view, when a patient obtains treatment at such facilities with compliant health IT systems, the patient should be able to download all the data from these systems and apply relevant information to the personal health record in the GCH platform. This will help the GCH users to aggregate their health data which is residing in various EHR systems into one place and have total control over their health records. GCH will also allow the data downloaded from various provider systems to be synched with the various sections in user's GCH personal and health information such as medical history, appointments, and medications.

Data will be imported from the provider health IT systems - EHR systems into GCH using Fast Healthcare Interoperability Resources (FHIR) interfaces provided by those systems. FHIR Draft Standard for Technical Use 2 (DSTU2) will be used for the communication between GCH and provider health IT systems. Data downloaded from different sources will also be organized and stored in separate folders within GCH to allow easy access and retrieval to forward to other parties in its original format if necessary.

Following steps show the workflow for user of GCH platform to download data from a provider health IT system and store the information for future retrieval as well as for synchronizing such information with patient record within GCH platform.

2.2.2.1 FHIR Resources

Data within the EHR systems is organized into various “Resources” and those resources can be accessed through FHIR interfaces.

At the root is the Patient resource which includes patient specific information like name, contact information, date of birth, address, marital status, contact person and care provider details. Patient resource will also have resources like FamilyMemberHistory, AllergyIntollerance and DetectedIssue associated with it in the EHR system.

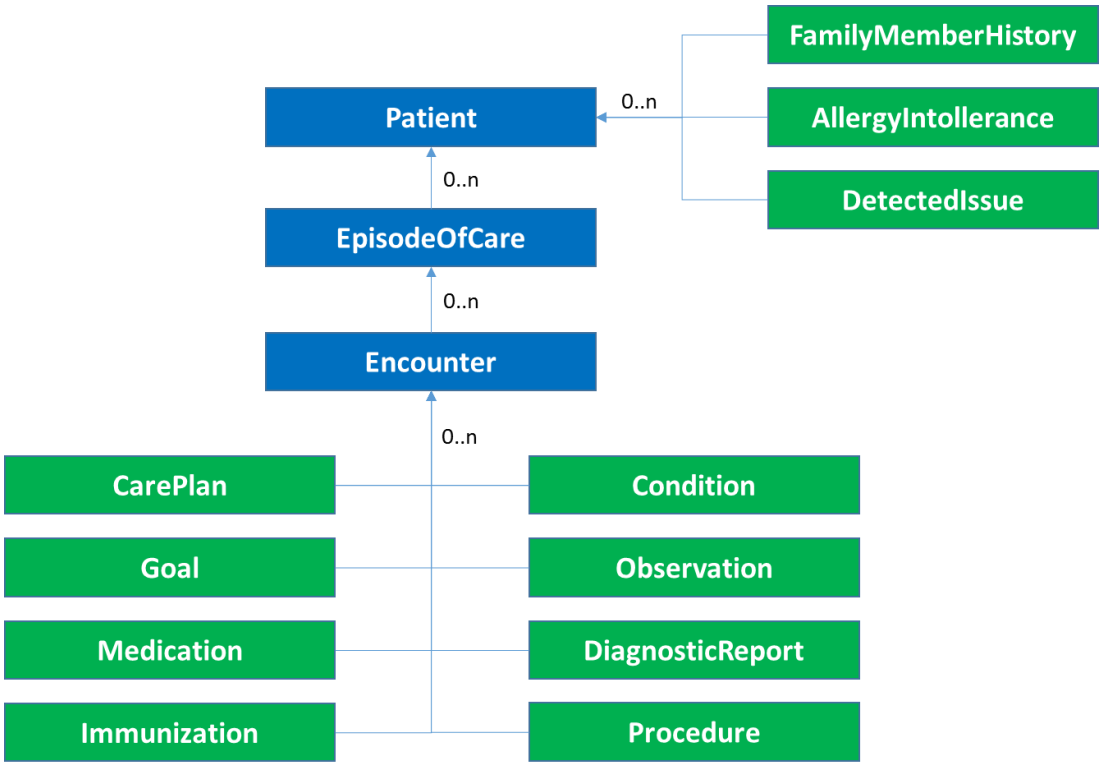
For each patient, there could be multiple EpisodeOfCare resources. Each EpisodeOfCare resource contains information about an association of a Patient with a healthcare provider for a period of time under which related healthcare activities may occur. In many cases, this represents a period of time where the healthcare provider has some level of responsibility for the care of the patient regarding a specific condition or problem.

There could be one or more Encounter resources associated with an EpisodeOfCare resource. An Encounter is interaction between a patient and healthcare provider for the purpose of providing healthcare service(s) or assessing the health status of a patient. Each encounter will have an “Appointment” resource associated with it which provides details about the booking of an event involving the patient and the care provider on a particular date and time. The data generated from an “Encounter” will be organized into various resources like Condition, Observation, DiagnosticReport, Medication, Procedure, CarePlan, Goal, Immunization etc.

The FHIR resources described above covers all the data elements specified in the Common Clinical Data Set published by ONC.

The following image shows the hierarchy of the various FHIR resources that will be imported by GCH from the EHR systems:

Note: The FHIR implementations of all EHR systems that GCH connects to need not necessarily implement all the resources shown above. Although GCH will be built to handle all the resources shown above, only the resources supported by the EHR systems will be imported to GCH.



2.2.2.2 Patient Record Matching

A Patient resource is identified within an EHR system using a unique identifier called the Medical Record Number (MRN). Patient resource can be accessed via the FHIR interface using either the MRN for that patient in that EHR or using First Name, Last Name and Date of Birth. The MRN for a person is not a unique identifier across multiple EHR systems. Also as a rule, most patients will not have any idea about their various MRNs at different places. However, when we use name and date of birth to get a user's record, there exists risk of someone getting other person's data by simply knowing this information. To avoid such risk and ensure data privacy and security, GCH will use additional information from the patient record in the user profile to ensure that incoming data is matching the same user information before downloading patient information (some parts of personal information or medical information retrieved from the EHR system should match the same data provided by the user in GCH). Data from EHR will only be imported if the Patient resource can be positively matched with the GCH user profile.

2.2.2.3 Medical Data Download

Data import from an EHR system starts with the user selecting a particular healthcare provider. All the providers whose EHR systems are integrated with GCH will be listed and the user can select from that list. If a given provider is not listed, user may ask GCH to connect to that provider and GCH will initiate a dialogue to consider implementing such integration, thus growing list of supported providers for electronic record retrieval.

Once the provider is selected the GCH user will be asked to enter their MRN for that provider or use name and date of birth may be used. GCH will try to pull the Patient Resource using that information. If there is no matching patient in the EHR system, an error will be displayed to the user. If there is a match, then the patient matching process described in the previous section will be performed. If a correct match of the Patient resource cannot be determined, an error message will be displayed and the data import will be terminated. On establishing a positive match of the Patient resource the relevant FHIR resources as described in section 2.2.2.1 will be downloaded and stored in to the user's healthcare provider records folders.

The patient data imported from different provider health IT systems sources will be organized and stored separately within the provider record folders. The user can access those at any time from their GCH account. User will also be able to select given record and ask system to synchronize the information with GCH profile/records. When all the downloaded records are processed, GCH record will become the master record with all the latest information updated for future use. However, user will always be able to go back to any record that was downloaded and can forward/share that record with other providers using the Share function supported by GCH platform as described later.

The following mockup screens demonstrate the workflow for integrating hospital EHR systems with a user's GCH account and synching data from those systems with their GCH profile.

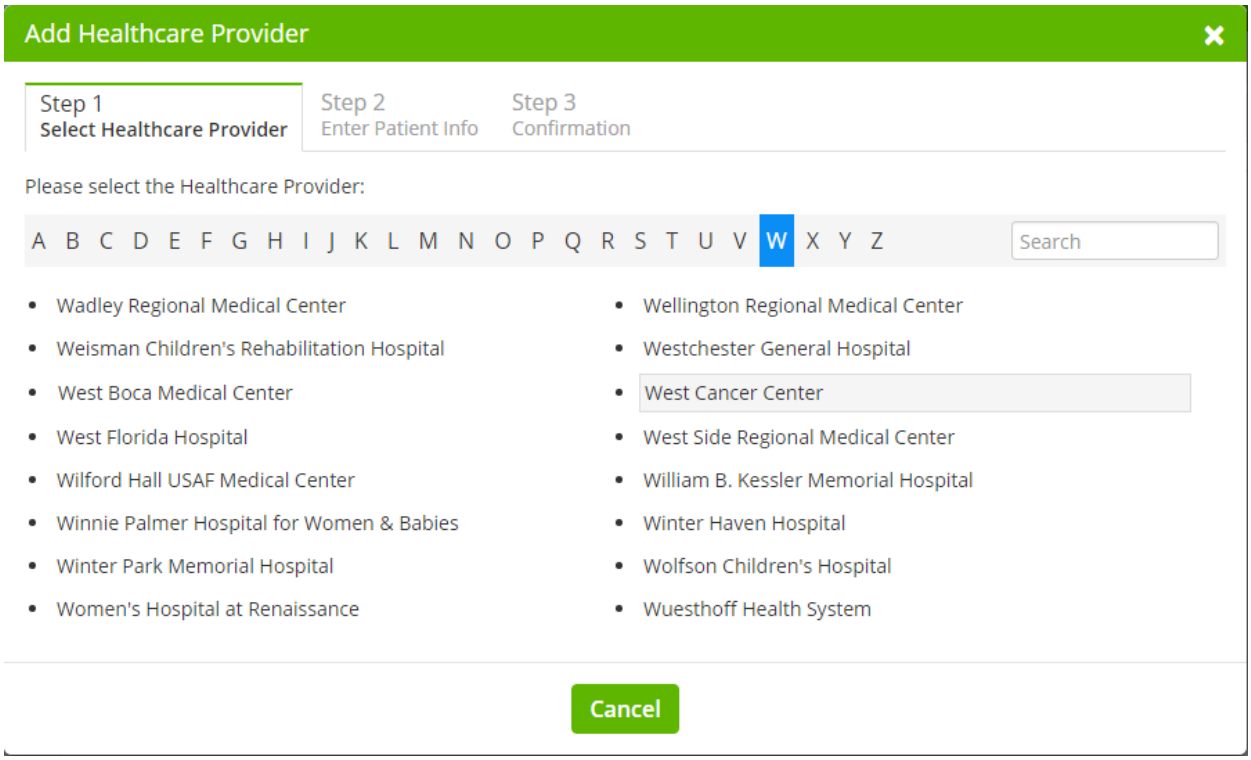


Figure 2: EHR System Setup Step 1 – Selection of Hospital/Provider

The processes of setting up a hospital EHR system for a GCH user, starts by selecting the hospital or care provider from a list of all providers supported by GCH. Figure 2 above shows a mockup of the screen where the user can select a particular hospital.

The second step in the process is to search for the user's record in the EHR system. This can be done either using the MRN, or if they do not know their MRN it can be done using the name and date of birth of the patient. If the user chooses to do the search using name and date of birth those details will be automatically populated if they already have it in their GCH profile. Otherwise they will be asked to enter the details and it will be saved to their GCH profile. Figure 3 below shows a mockup of the screen where the user can provide the details required to identify the user in an EHR system.

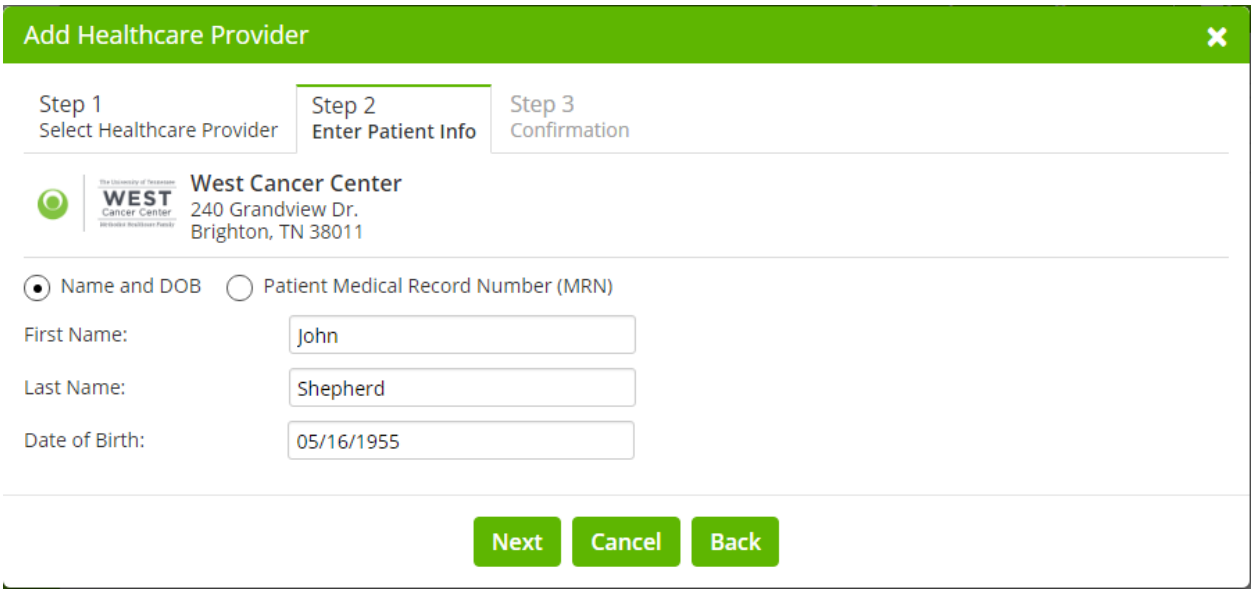


Figure 3: EHR System Setup Step 2 – Data for Patient Identification

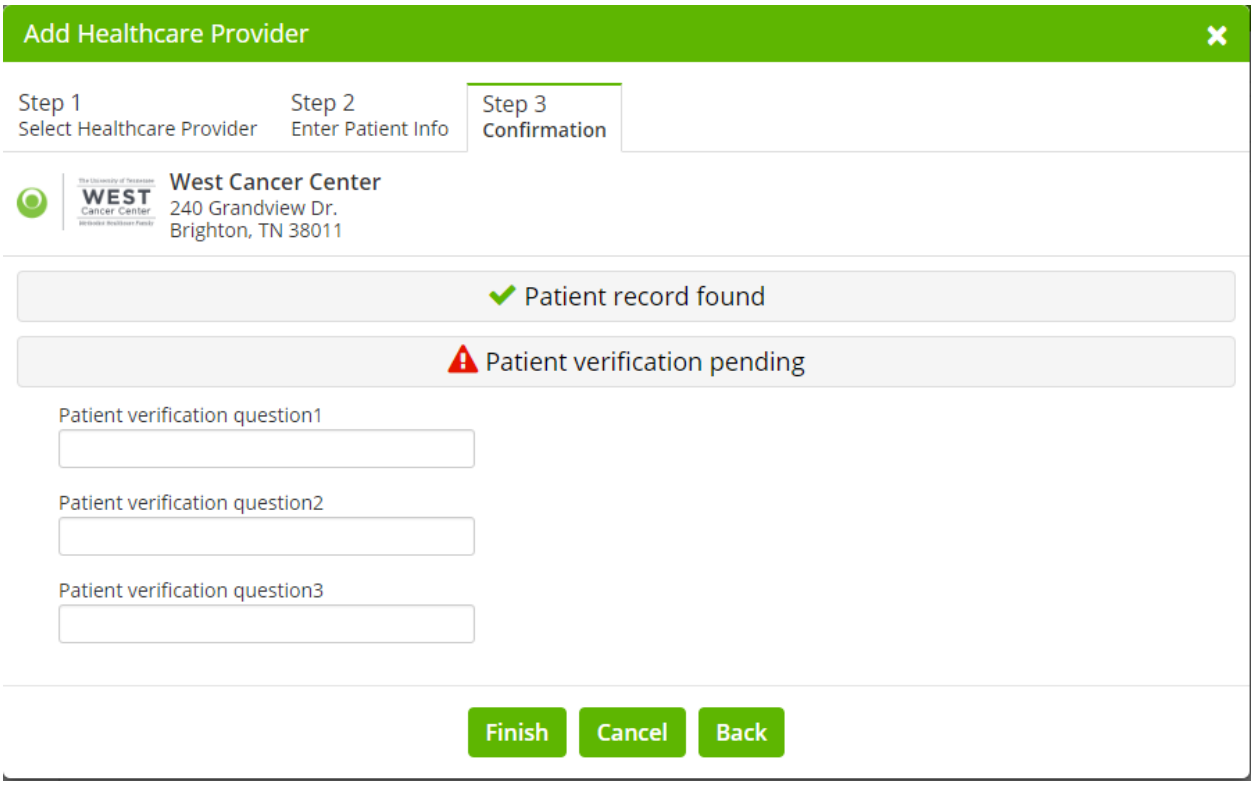


Figure 4: EHR System Setup Step 3 – Patient Matching and Verification

In the final step of the EHR setup process, the patient record in the EHR has to be positively matched with the profile of the GCH user. This will be done using a proprietary algorithm

developed by GCH which will do a matching based on the data that is already available in the GCH profile of the user as well as through some random questions that only the owner of the EHR data will be able to answer. Figure 4 above shows the screen where the input for the patient record verification can be entered by the user.

If a positive patient record match is done, all the data for that user from the EHR system that newly connected will be downloaded into their GCH profile. From that point forward, the user can sync data from that EHR system with their GCH account at any time without going through the setup and verification process. The following screen provides the user with a view of the all the data synched from a particular EHR system. The newly synched data is highlighted in red for easy identification. Figure 5 below shows the screen where the user can see all the data for the EHR system that they connected and synched with GCH.

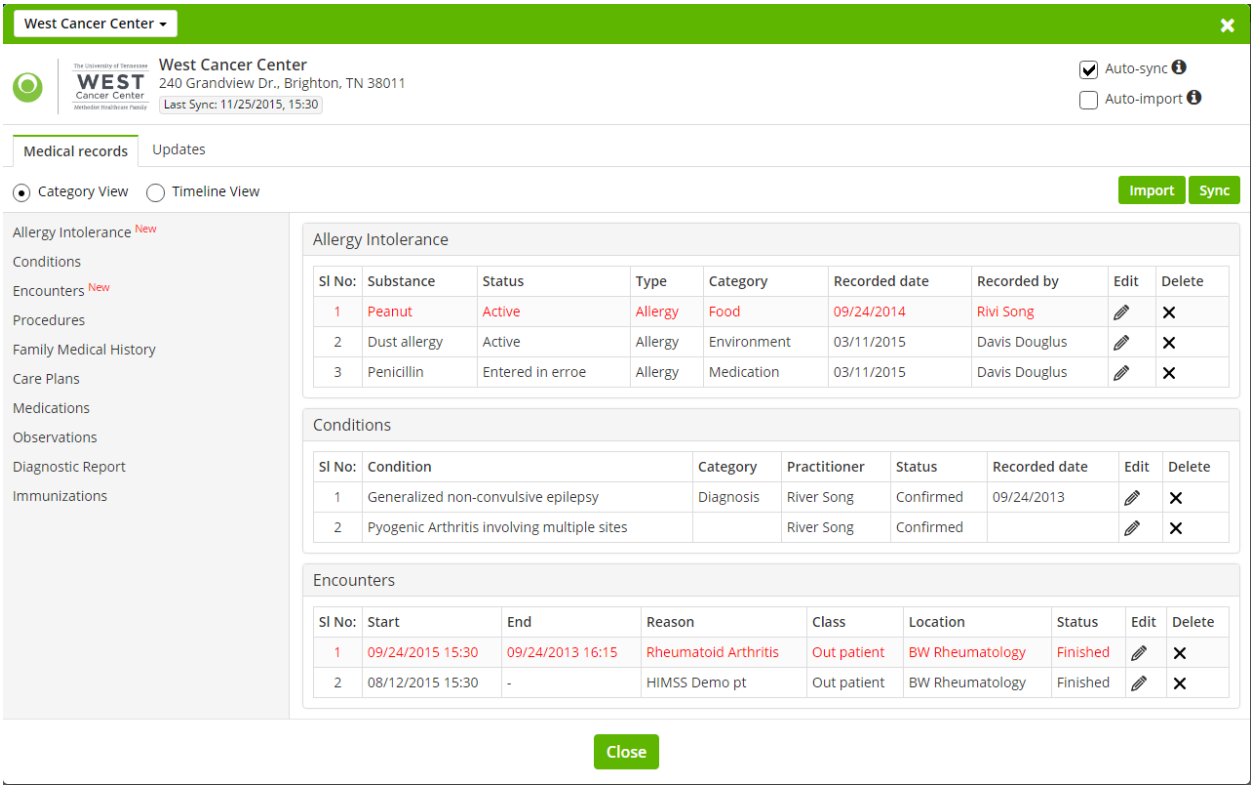


Figure 5: View of Data from an EHR System synchronized with GCH

After synching the data from the EHR system with GCH, the user can also import relevant data from those records into their GCH profile.

The user will be asked to select the EHR records that they want to import into their GCH profile. They can import multiple records at a time by selecting all the required from the list of available records shown.

Figure 6 below shows the screen is where the user will select the records to be imported to GCH:

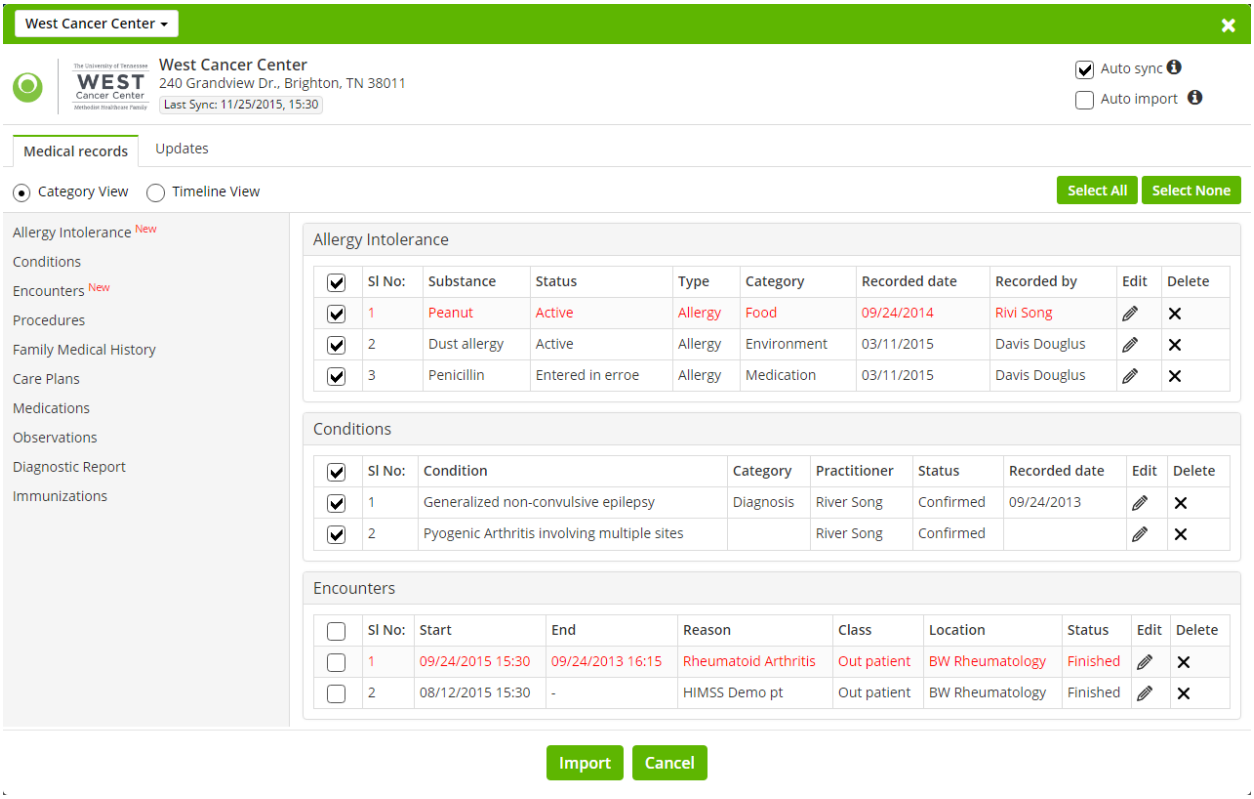


Figure 6: Screen to select EHR data to be imported to GCH Profile

Once the user selected import function and imported certain records, a detailed list of field by field match of GCH internal data and data being imported from each record will be displayed with option for user to accept or reject incoming data for all fields or individual fields. Screen layout for this is not included here. This will give user the control to decide how much of incoming data should be applied to their personal record. Internal audit trail function for the service will maintain history of such changes.

GCH will also give the user a dashboard where they can view summary of all the EHR systems that they have connected and synched with GCH. Figure 7 below is a mockup of the Dashboard with shows the summary of the data that has been synched from the various EHR systems that the user has setup at GCH.

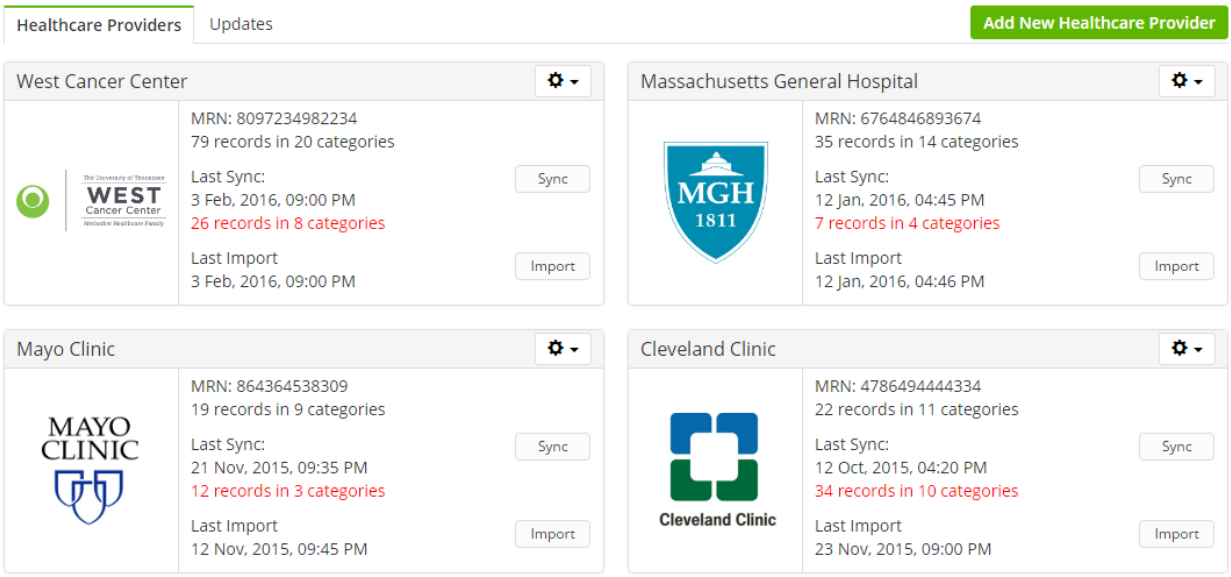


Figure 7: Dashboard showing summary of all the EHR systems integrated with GCH profile

2.2.3 Consumer/Family Health Dashboard

The system supports multi-factor authentication with SSL connection to ensure privacy and security of all the data. When the user logs into their GCH account, the default page that loads up would be a personal health dashboard. The dashboard will have summary information about health and wellness condition of the user derived from all the different medical information stored and managed in GCH. The dashboard will have separate sections (tiles) to highlight personal health profile, medical vitals and activity data, medications, appointments, immunizations, documents, care programs, records from health providers, messages and notifications. The health profile tile on the dashboard will show the percentage completion for the different parts of user's health profile like personal information, medical history, family history, review of systems and emergency information. Vitals tile will show the latest readings for the various vitals being tracked by the user. While the medications tile will show the

medications that the user is currently taking, appointments and immunization tiles will show the next appointments or immunizations that are coming up for the user. The documents tile will show a list of documents (medical records or images) that were uploaded by the user to GCH and care programs tile will display the status of the various care programs that the user has joined. The healthcare providers record tile will show the records available or downloaded from third party EHR platforms. The following image shows a prototype of a sample GCH health Dashboard. While the focus of this Challenge is to bring data from various healthcare provider platforms, the dashboard is designed to make the health and wellness of the user and delivery of actionable insight the focus of our design while making data import/export a simple function yet not a focal point of user experience shown here under Health Providers tile.

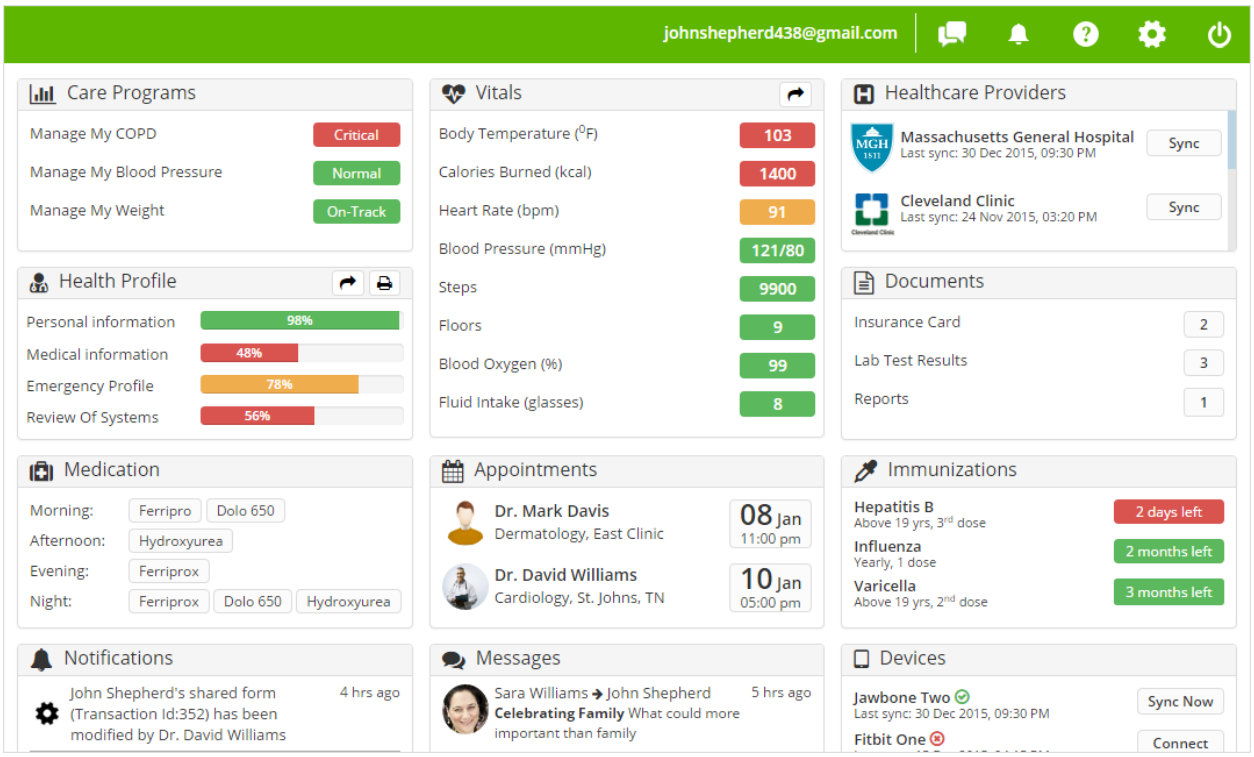


Figure 8a: Main GCH Dashboard for an individual user

Figure 8a above shows the main dashboard for a GCH user. Figure 8b shown below are views of the same screen when viewed on a smaller size screen like a smartphone. The contents will be automatically rearranged to fit the size of the viewing screen.

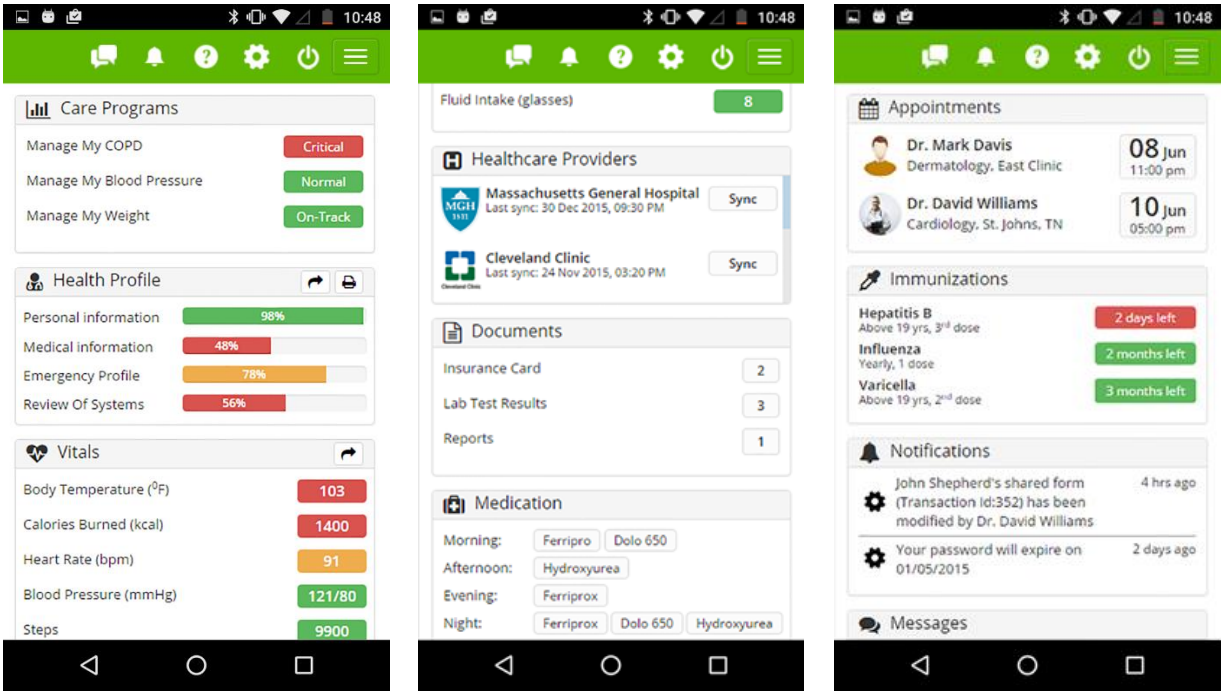


Figure 8b: Main GCH Dashboard for an individual user (Smartphone View)

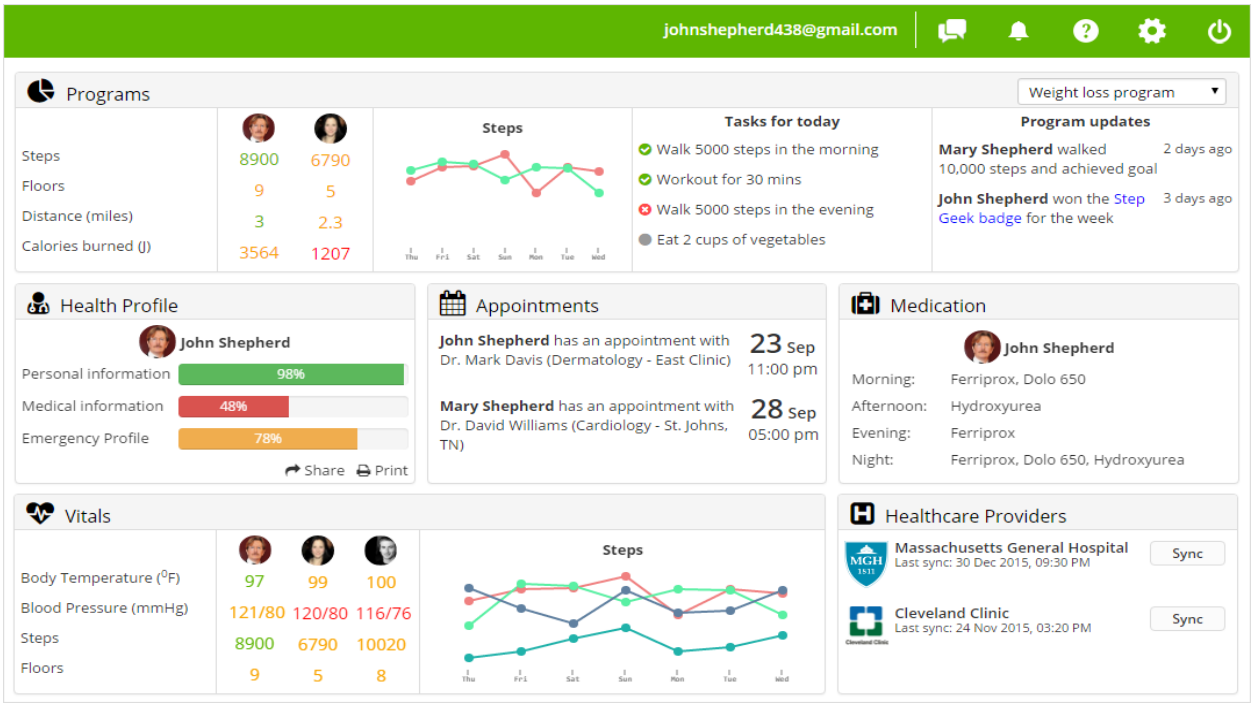


Figure 9: GCH Family Dashboard

GCH users can also create and manage profiles of their family members. When multiple family members are setup under a GCH account the dashboard will show summary information for all the family members. Figure 9 above shows the family dashboard that consolidates summary of GCH data for all the family members who are setup under a GCH account.

2.2.4 Consumer and Family Health Profiles

GCH users can create health profiles for themselves as well as for other members of their family and can switch between the different profiles and mange those individually. Proper HIPAA compliant access authorization for sharing of data among family members is managed as a part of multiple profiles activation by the system. Users also retains full control on what parts of their medical information is shared with whom for what action and for how long.

The health profile is broadly classified into two sections, General Forms and Specialty Forms. These areas will be further grouped into various subsections such as personal information, medical information, review of systems and list of specialties to make the data entry and management easier as described in the subsections below. While user may enter some or all of this medical history – information similar to typically collected using a set of forms in front office – with aggregated data coming from various EHR systems, user will have option to apply any latest information from those records to their GCH profile and automatically update it here.

Figure 10a below shows the GCH Health profile dashboard. It shows the percentage completion of the various subsections under the Heath Profile. Figure 10b shows the same screen as viewed using a smartphone.

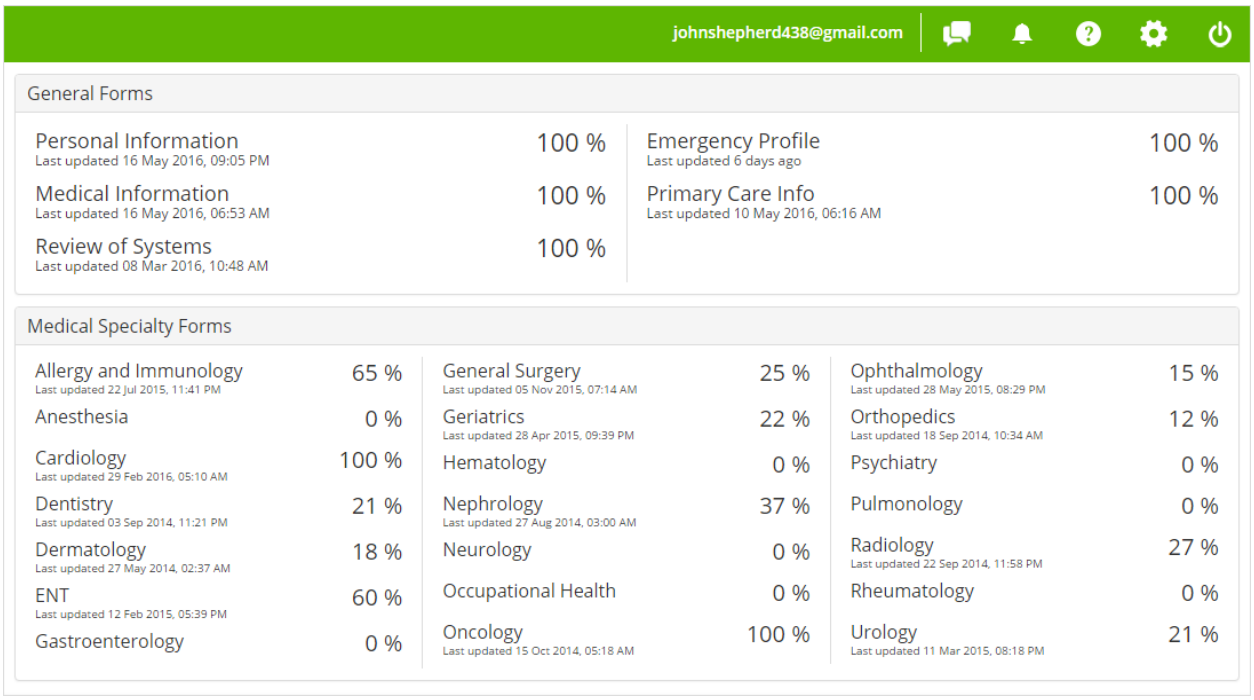


Figure 10a: GCH Health Profile Dashboard

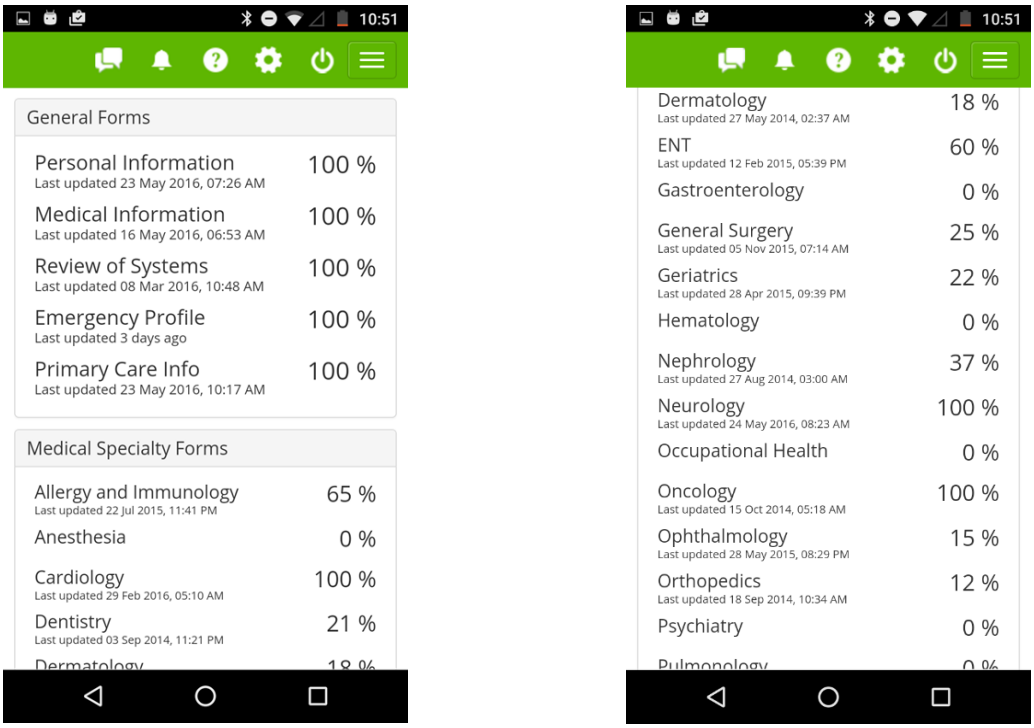


Figure 10b: GCH Health Profile Dashboard (Smartphone View)

2.2.4.1 General Forms: Personal Information

Personal information will include the demographic information about the individual like name, gender, race, date of birth, SSN, address, contact information, employment information, insurance info, power of attorney info, pharmacy, and primary care provider info. As described before, this information may also be updated using data from EHR systems.

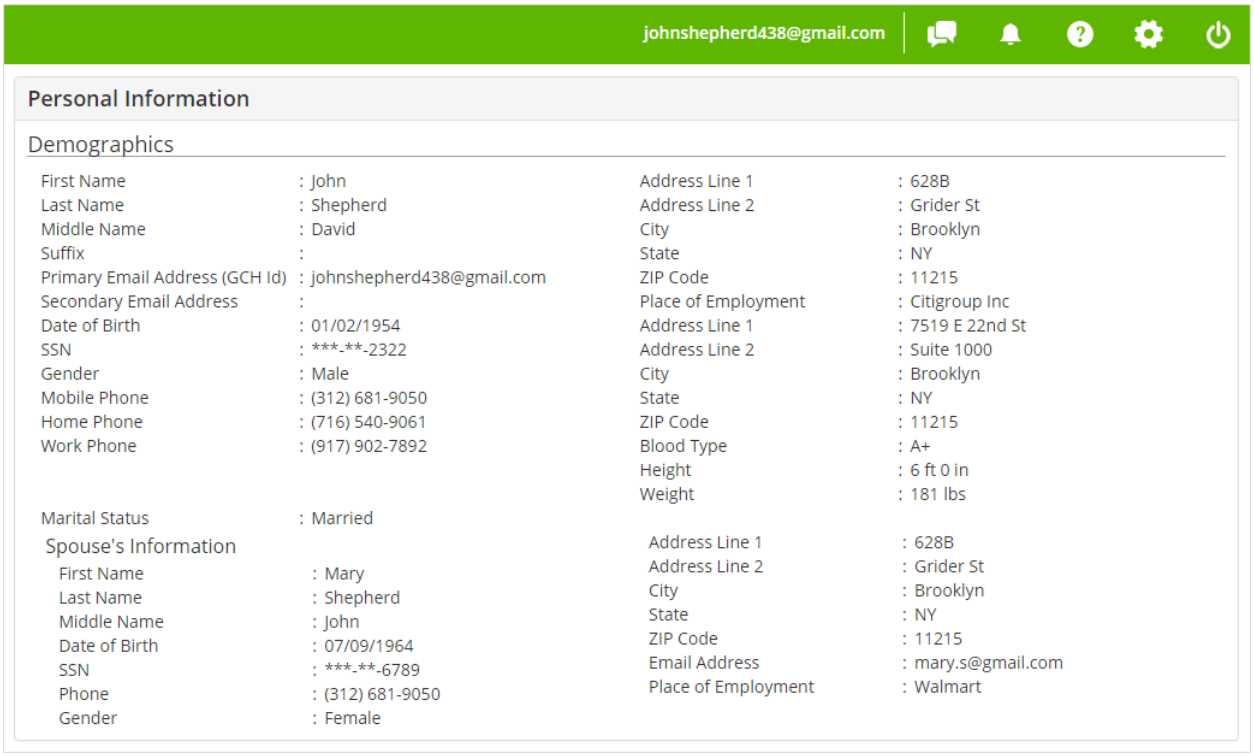


Figure 11a: GCH Profile - Personal Information

Figure 11a shown above is a view of the GCH user's personal information that is stored in the GCH profile. Figure 11b shown below is a view of the same data while being accessed using a smartphone.

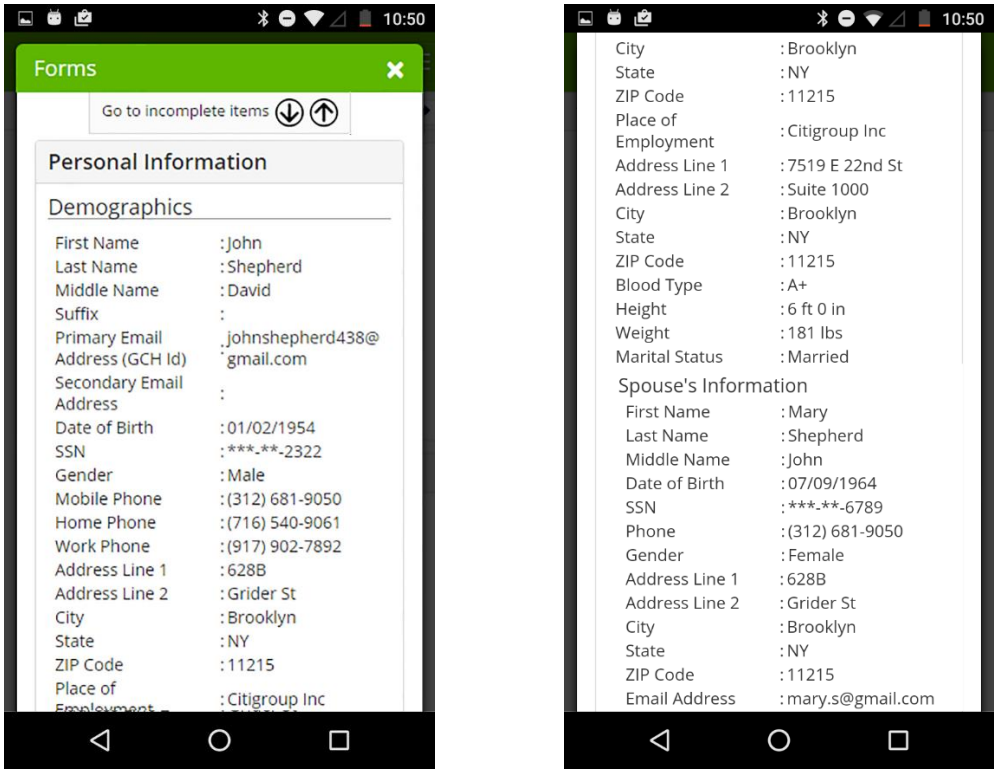


Figure 11b: GCH Profile - Personal Information (Smartphone View)

2.2.4.2 General Forms: Medical Information

Medical information will include history of medical conditions, social and lifestyle history, allergies, immunization, medications, review of systems, family medical history, prior treatments, existing conditions, surgeries, procedures and typical other information requested by primary care providers. Figure 12 below shows a screenshot of a partial view of a medical data form in GCH.

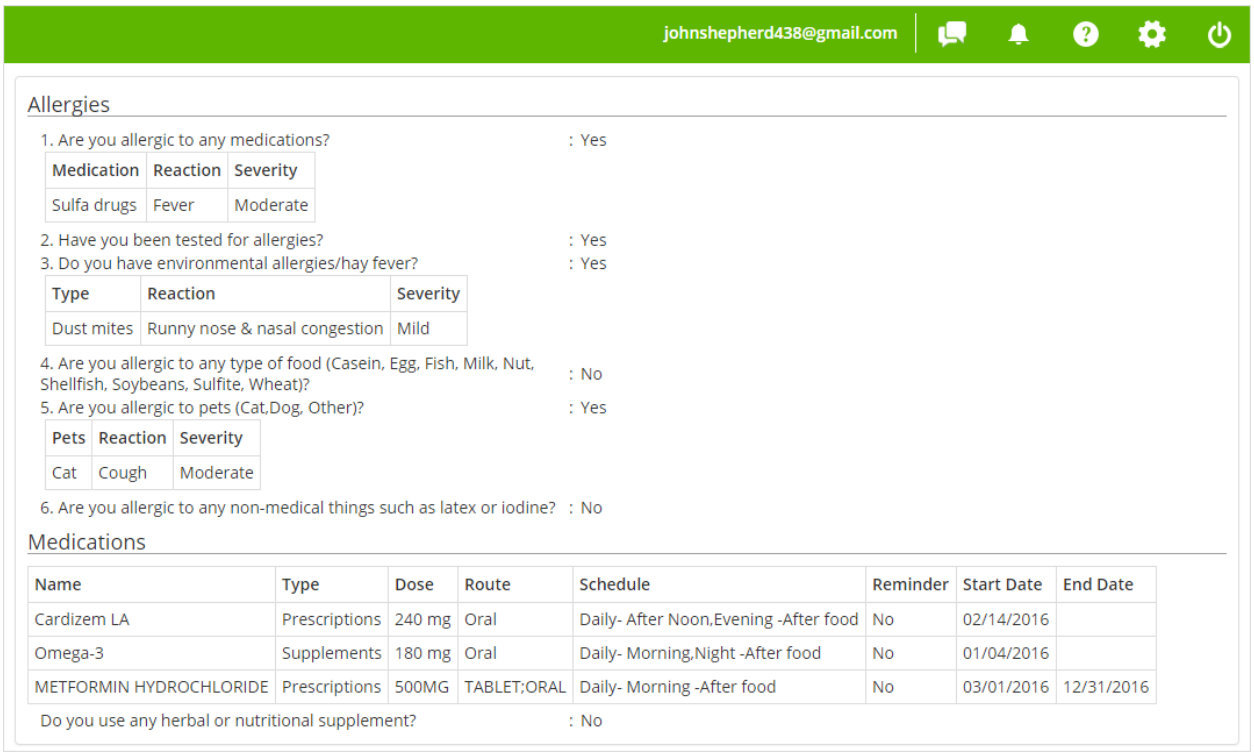


Figure 12: GCH Profile - Medical Information

2.2.4.3 General Forms: Emergency Profile

Emergency profile will include details like emergency contact details, medical insurance information, primary care physician, pharmacy details etc. Following shows a sample of Emergency Profile and an Emergency Card. The GCH Emergency Card has information about the GCH user including medical insurance details and could be printed and carried with the user at all times.

Figure 13a shown below is a view if the GCH user's emergency profile information.

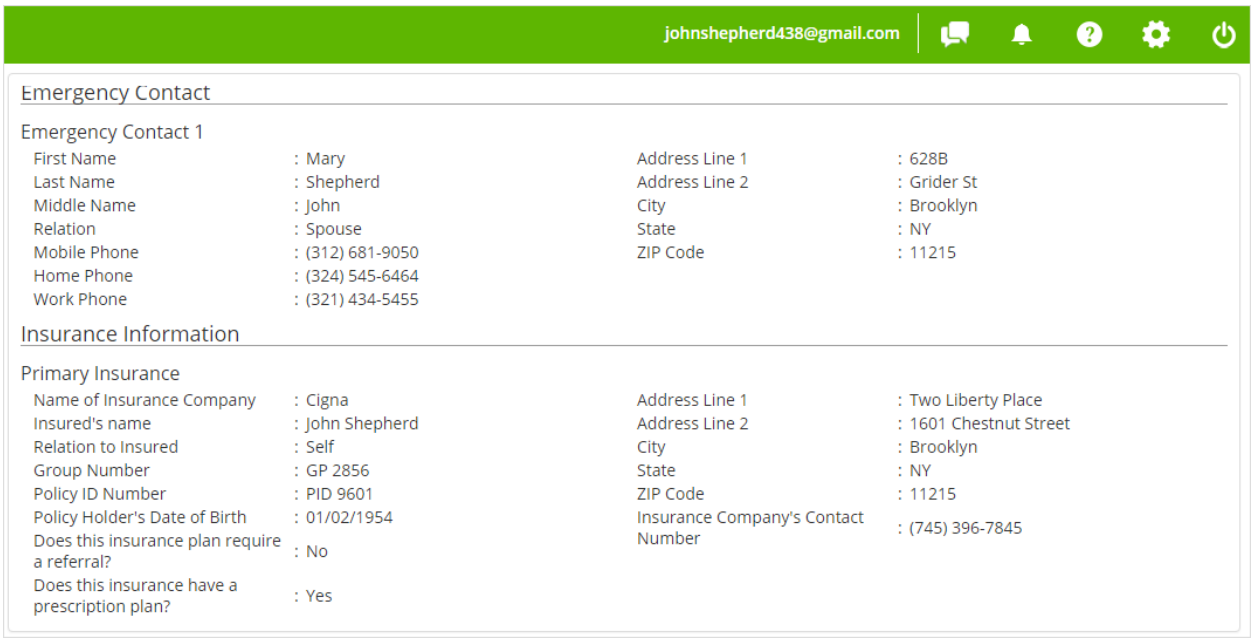


Figure 13a: GCH Profile – Emergency Profile

Figure 13b below shows the GCH Emergency Card.

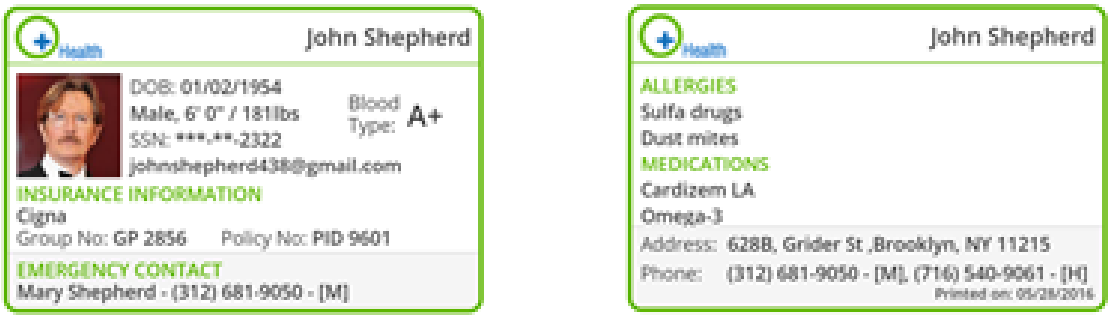


Figure 13b: GCH Profile – Emergency Card

2.2.4.4 Specialty Forms

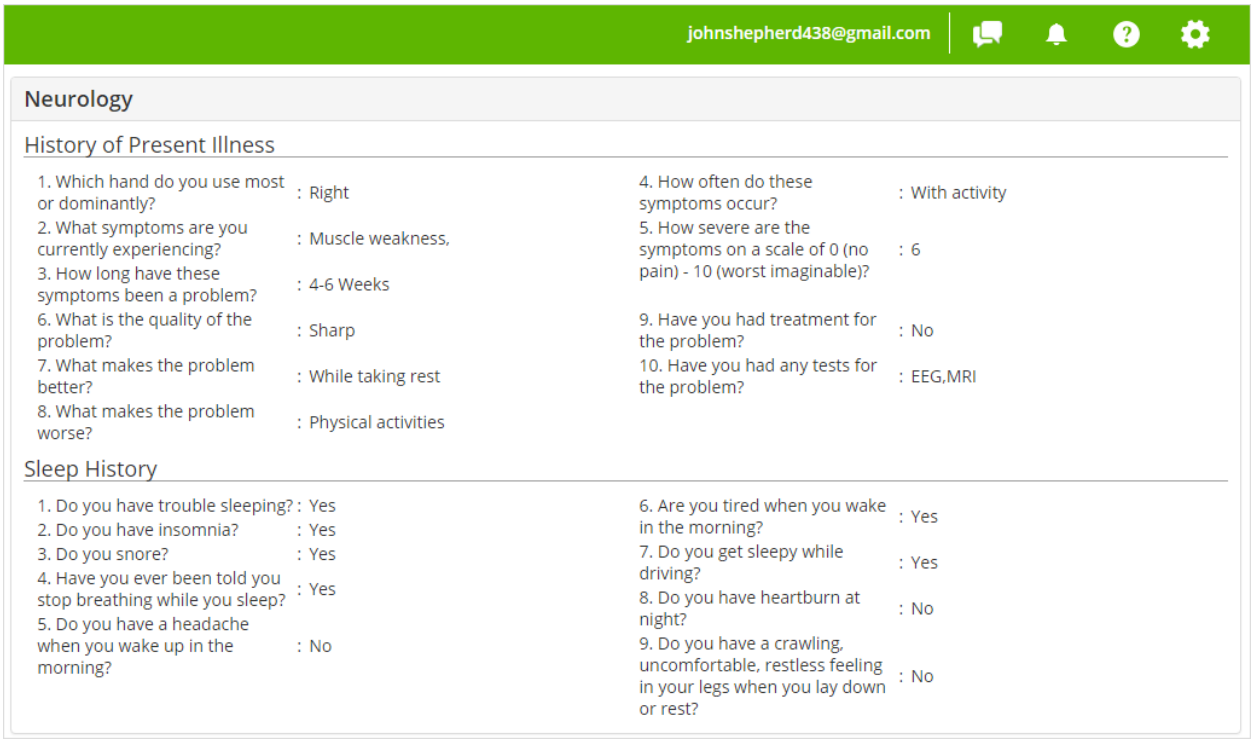


Figure 14: GCH Profile – Specialty Forms

These are data sets typically needed when visiting a given specialty. These forms are typically used in conjunction with General Forms to give the physician complete history of a patient at the time of checking in for treatment or follow up visits.

2.2.5 Medications

Under the medications section in GCH, users can store records of all the past medications as well as the medications they are taking currently. It allows the users to select the medication from a database of all FDA approved medications and they can also manually add the medications by typing in the details, and select the timing and dosage of the medications. GCH also allows users to setup medication reminders. Reminders will be sent via email and/or SMS per user preference during the day. One may configure the system for user to acknowledge taking a medication to further confirm compliance with recommended doses and exception

handling. When data is imported from EHR system, the user will have option to apply that data automatically to this section.

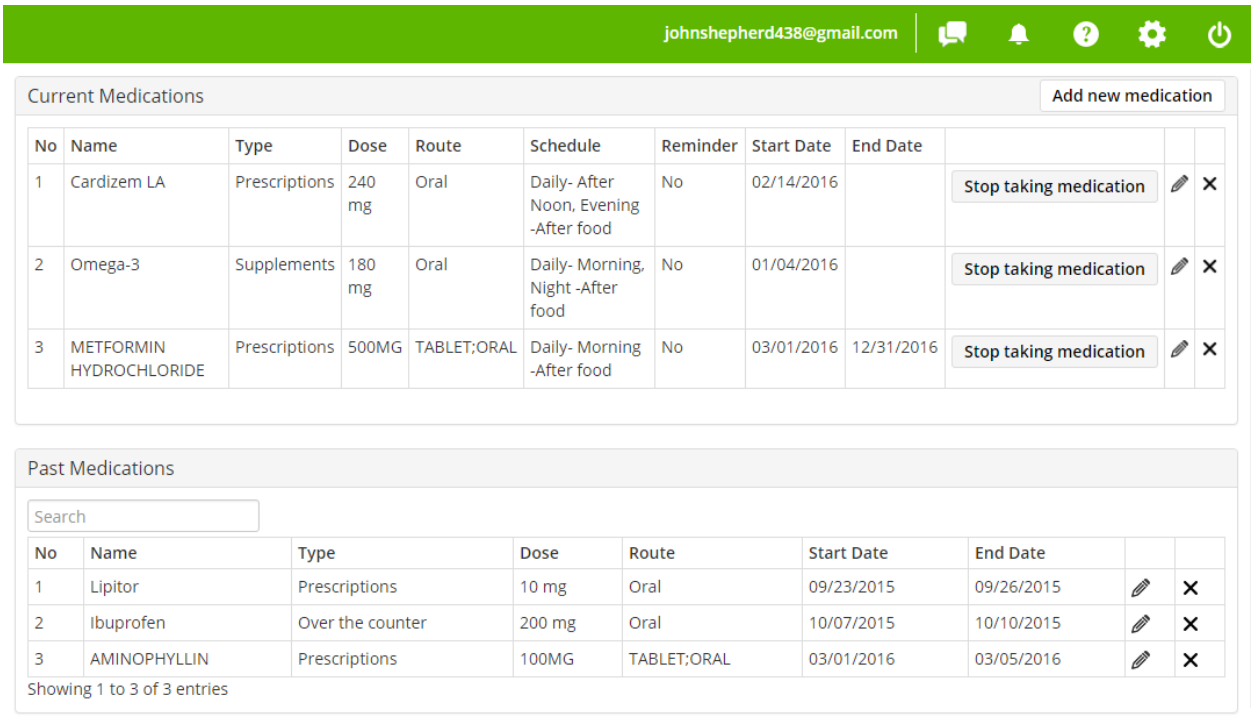


Figure 15: GCH Profile – Medications

2.2.6 Immunizations

In this section, the user can keep track of all their immunizations. Immunizations as per the CDC recommended schedule can be automatically identified based on age and past immunization history to schedule upcoming immunization visit for the users. GCH will send out reminders in advance when immunizations are due so that the user can schedule appointments with their care providers. The immunizations that are completed can be marked as completed in GCH. At any point of time the users can generate their immunization report which will show all the immunizations that were taken (with dates) as well as the scheduled immunizations that are coming up. This data can be updated from the information coming from EHR as explained before.

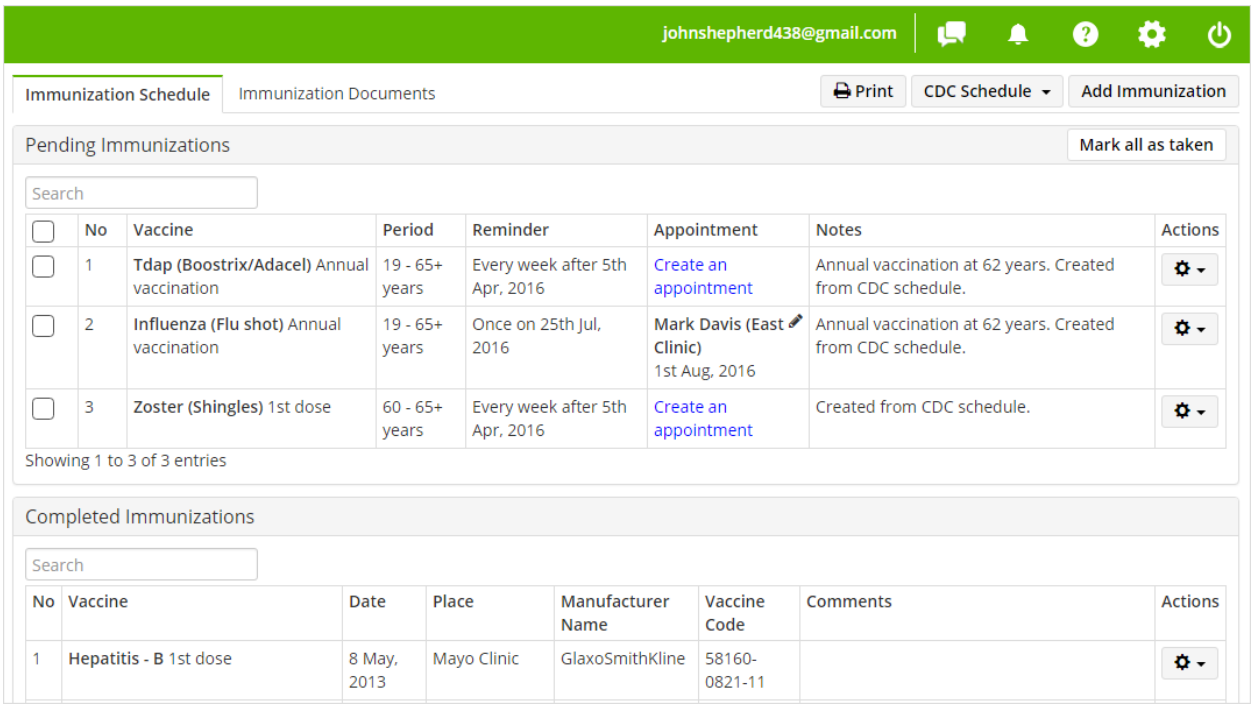


Figure 16: GCH Profile – Immunizations

2.2.7 Appointments

Appointments section will store records of all the past as well as future medical appointments for the patients. In the family view it will include appointments for the entire family. In addition to appointment data and time, it will allow the users to send medical records including those collected through EHR interface defined in this document to providers for their upcoming visit. It will also allow them to upload medical records like lab test results, medical imaging and other diagnostic records from the past visits for future reference. They can also download data from providers EHR and link them to a completed appointment. Users will have the ability to set reminders for future appointments. For example, users participating in the Bright Futures program (for newborn kids to the age of 21) will have the option to automatically setup all their Bright Futures program recommended appointments in GCH. GCH will automatically send out the reminder messages as per the user settings. GCH can send out reminders via email as well as SMS messages to the users' cell phone.

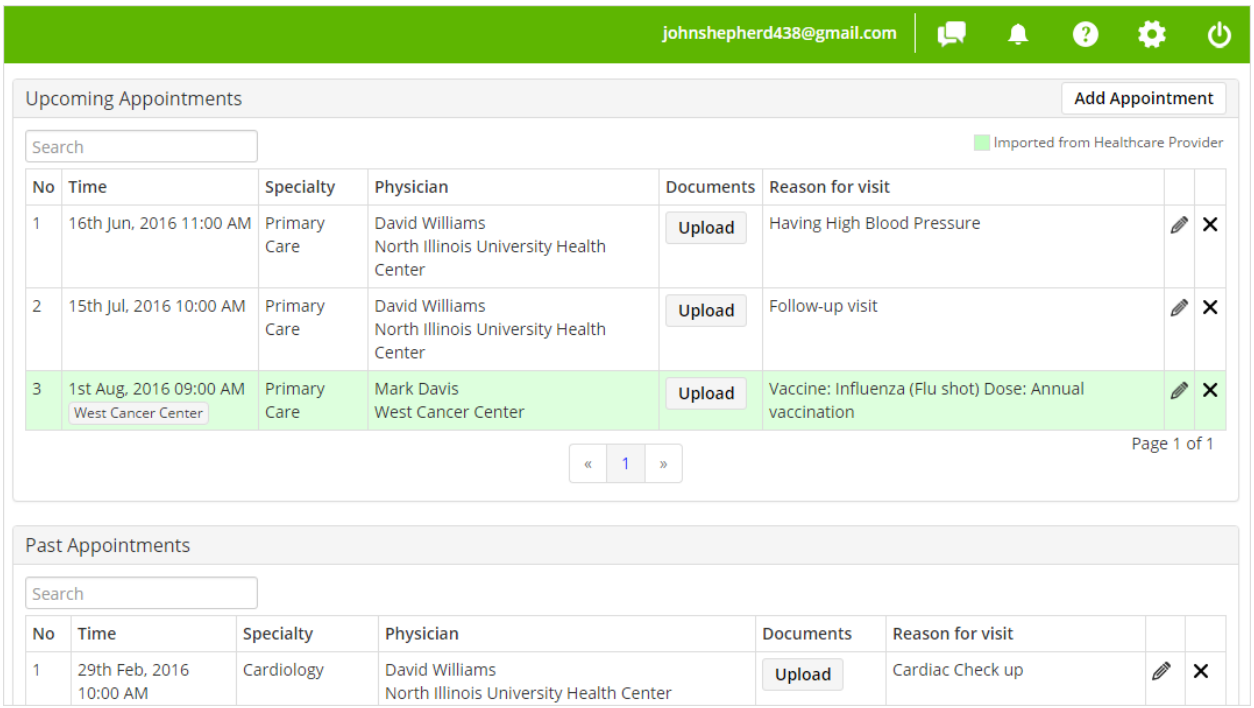


Figure 17: GCH Profile – Appointments

2.2.8 Documents

The Documents feature of GCH allows user to store all types of documents securely in their personal repository. Those could be medical records, medical images, lab test results and other diagnostic reports. Users can classify the documents while uploading and the documents will be organized under various classifications for easy access. When downloading records and documents via FHIR interface from the EHR platform of the providers, those documents will be stored in separate folders from the manually uploaded documents.

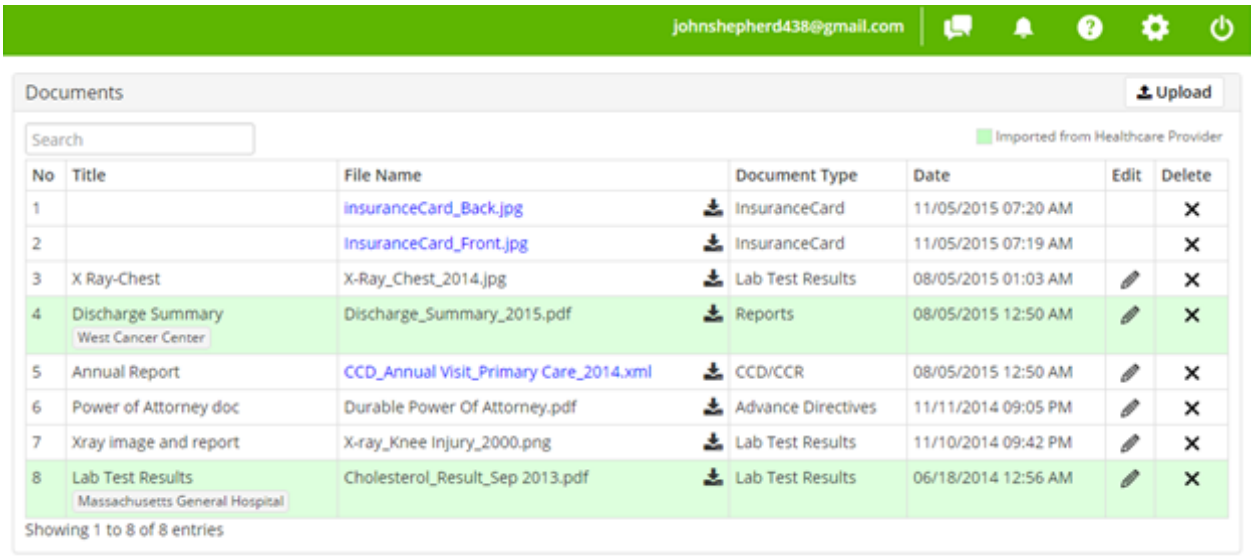


Figure 18: GCH Profile – Documents

2.2.9 Vital Measurements

GCH allows users to keep an ongoing record of their health vitals and activities. The following vitals will be supported by GCH as a standard set of measurements. Additional vitals may be created as needed for a given wellness or care management program or as per user needs.

GCH Standard Vitals	
Height	Blood Glucose
Weight	Insulin Intake
Body Temperature	Cholesterol
Heart Rate	Urinary Output
Blood Oxygen	Pain Level
Blood Pressure	A1C (Glycated Hemoglobin)

Users can also track their daily activities like steps walked, floors climbed, exercise, distance, calories burned, calorie intake, sleep etc. in GCH.

GCH Standard Activities	
Steps	Floors

Distance	Calorie Intake
Calories Burned	Fluid Intake
Exercise	Sleep

In addition to the standard vitals and activities supported in GCH, users will also have the option to define custom vitals and track those as well. User may define the frequency and method of data input for the vitals so vitals like activities may be updated daily while medical data may only be updated based on required input from their care mangers. System will allow user to configure various alerts and notifications to remind time to enter vitals, or alert about a missed vital, or when vital measurements are outside their set bounds. Such alerts may be delivered to different users via different methods as needed.

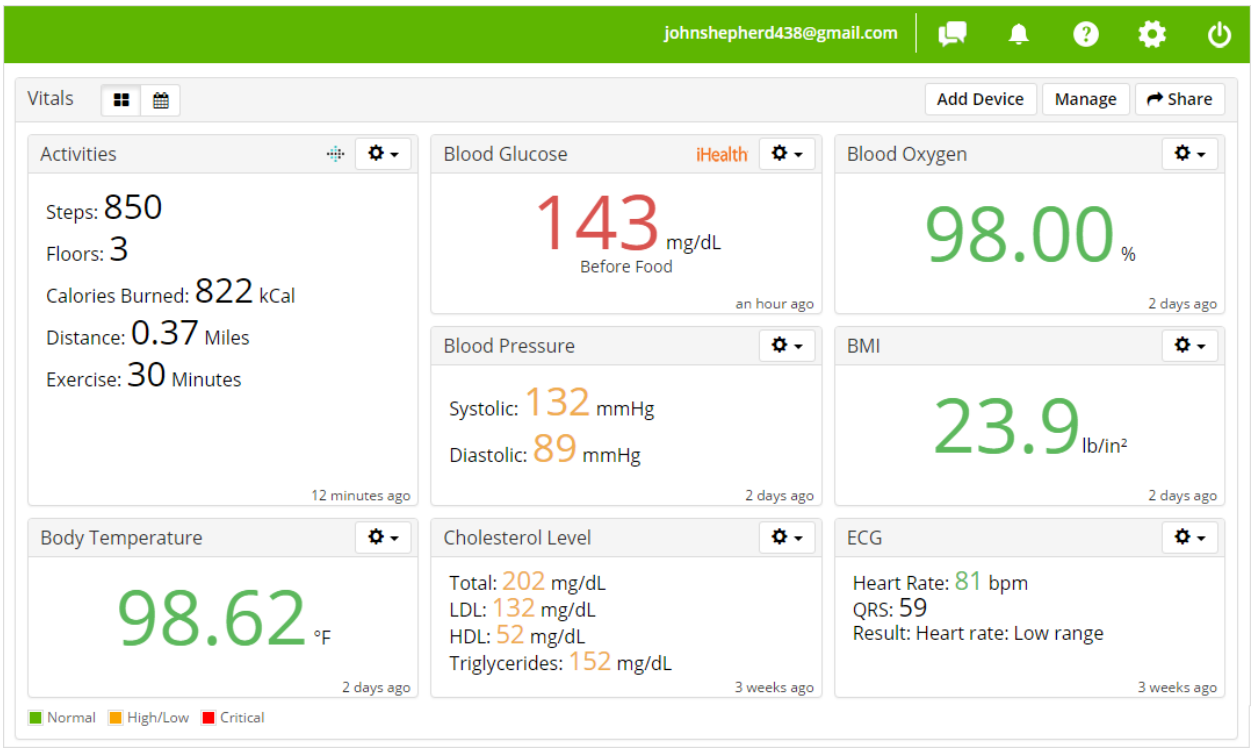


Figure 19a: GCH Vitals Dashboard

Figure 19a above shows the Vitals Dashboard for a GCH user. The dashboard shows the latest readings of all the vitals that the user tracking in GCH. Figure 19b shown below is the same dashboard as seen on a smartphone.

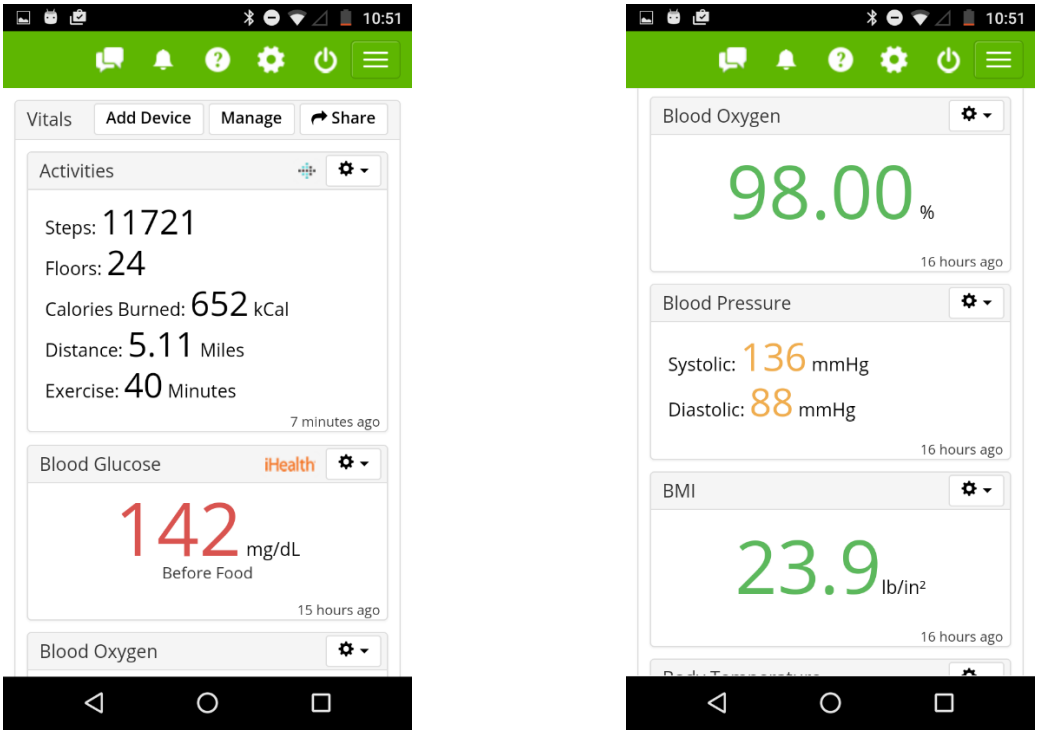


Figure 19b: GCH Vitals Dashboard (Smartphone View)

Figure 20 shown below is the detailed chart for a vital (Blood Glucose). User will be shown both a chart and a table with the available readings for a selected date range.

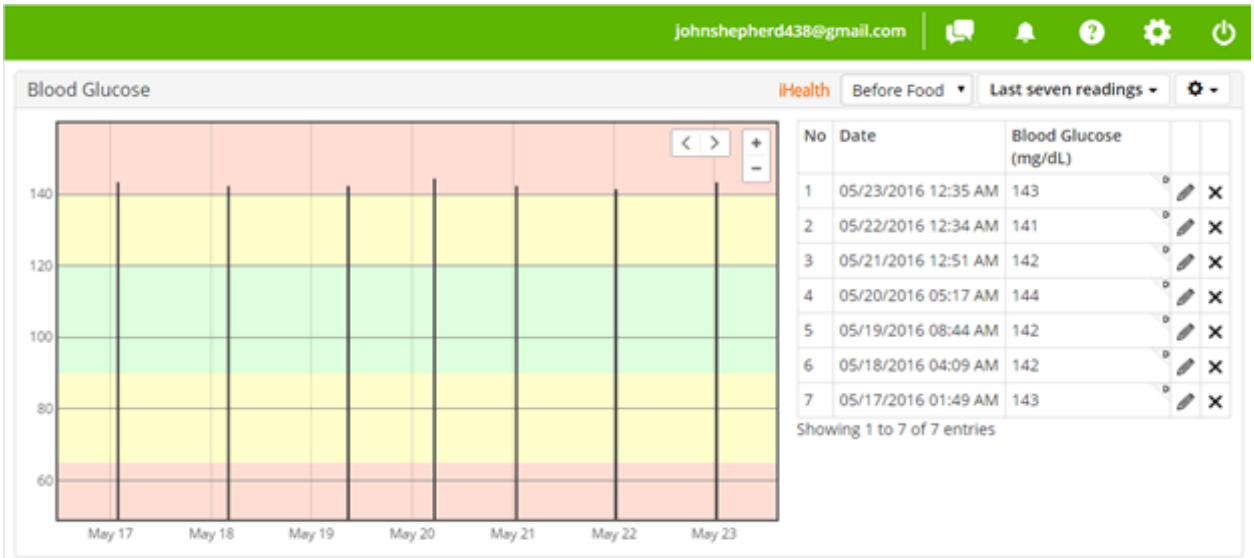


Figure 20: GCH Vitals Chart

Daily, weekly and monthly charts will be shown for the various vitals for the users to view their progress and trends against set goals. Each vital is defined with normal, high/low and critical values to allow user to set boundaries and goals. With vitals like Weight or BMI user is given normal value charts based on age and gender to help define their own ranges and goals. System will generate alerts and reminders based on use defined criteria for a vital or activity measurements.

The platform supports both manual and automated data entry of the vitals. When user has a connected device that automatically upload the data, system uses that value to update user records. For other cases, the user either makes one vital data entry or multiple data entries using a calendar view. System will also take vitals measurements from records received from various EHR interfaces when available.

2.2.10 Connected Personal Health Devices

GCH will support automatic data upload from connected personal health devices and activity trackers available in the market which has Bluetooth or Wi-Fi connectivity. While using those devices to measure the vitals or track activities, the readings can be automatically uploaded to GCH without the users having to manually enter the data. If the users have devices that cannot connect to GCH, they can also manually enter the readings. A very easy and user friendly interface will be provided for the users to manually enter the data.

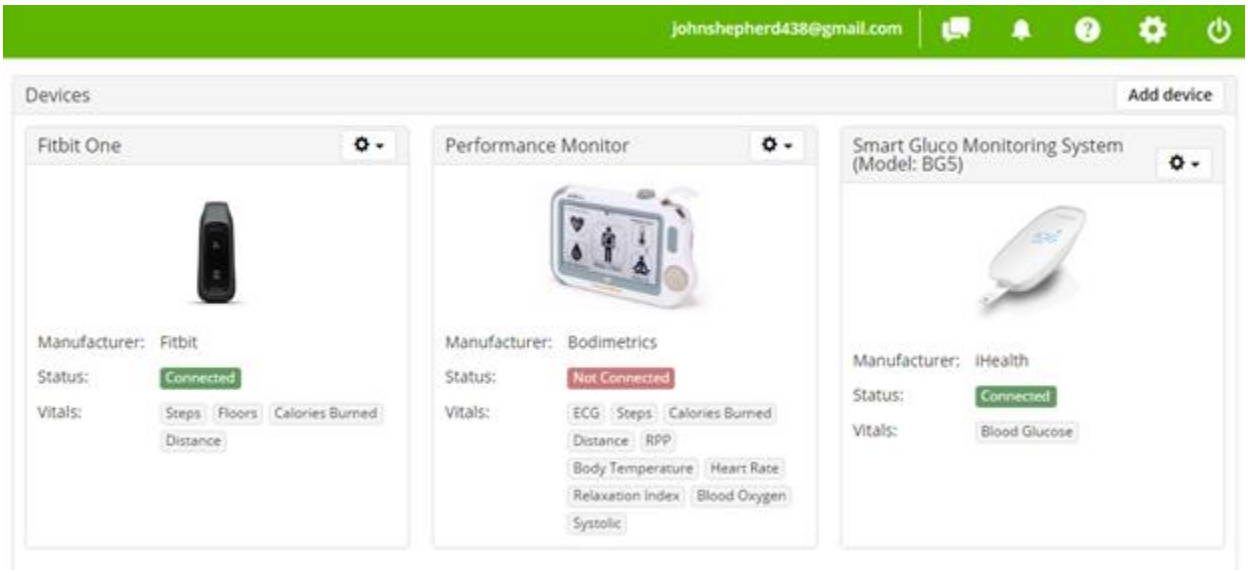


Figure 21: GCH Connected Devices

2.2.11 Care Programs

GCH will offer a number of wellness and care programs that will enable users to monitor and manage their health, wellness and various medical conditions. These programs supplement the treatment plans and protocols recommended by physicians and medical caregivers and can be managed by the patients with help from their family members. There are self-managed and third party managed care programs. These third-party managed programs support real-time monitoring and coaching by the healthcare provider to ensure health and wellbeing of the patient and they offer the ability for patients to communicate with the care providers in real-time.

Studies show that daily monitoring of activities and objective measurement of various “vitals” (measurement of various parameters such as heart rate, blood pressure, temperature, blood glucose, weight, physical activities etc. are called “vitals” throughout this document) will have a favorable impact on healthcare outcomes. Patients often need reminders to take their prescription medications on time or to measure certain vitals. Ongoing coaching and interaction with care providers is important to make life style changes for better health and better healthcare outcomes.

Participants in these care programs will measure and report vital signs like blood sugar, blood pressure, body temperature, body weight, pulse rate etc. in addition to their daily activities and diet. They may also report symptoms such as dizziness, weakness, pain and nausea. The frequency of such reporting is based on the specific program protocols and the need of each participant. Vitals can be measured using activity trackers and personal medical devices like blood glucose meters, blood pressure monitors etc. Participants can either record the data from the devices manually or use devices that support Bluetooth to automatically upload the data into their GCH portal. Notifications like alerts and reminders will be sent to the participant according to their preferences and medical literature and articles specific to the condition will be made available in GCH. When care program related information is provided in reports aggregated from an EHR platform, that information may be used with respective care program in GCH platform making it easy to configure such program for the user.

GCH will offer the following self-managed care programs to manage the following conditions:

GCH Standard Care Programs	
Manage My Weight	Pediatric Care with Bright Futures
Family Wellness	Manage My COPD
Manage My Blood Pressure	Manage My Asthma
Manage My Diabetes	Manage My Sickle Cell Anemia
Prenatal Care	Manage My CHF

GCH displays a listing of the Care Programs that are offered with brief description about each (shown in Figure 22 below). The users can join any or all of the care programs that are offered.

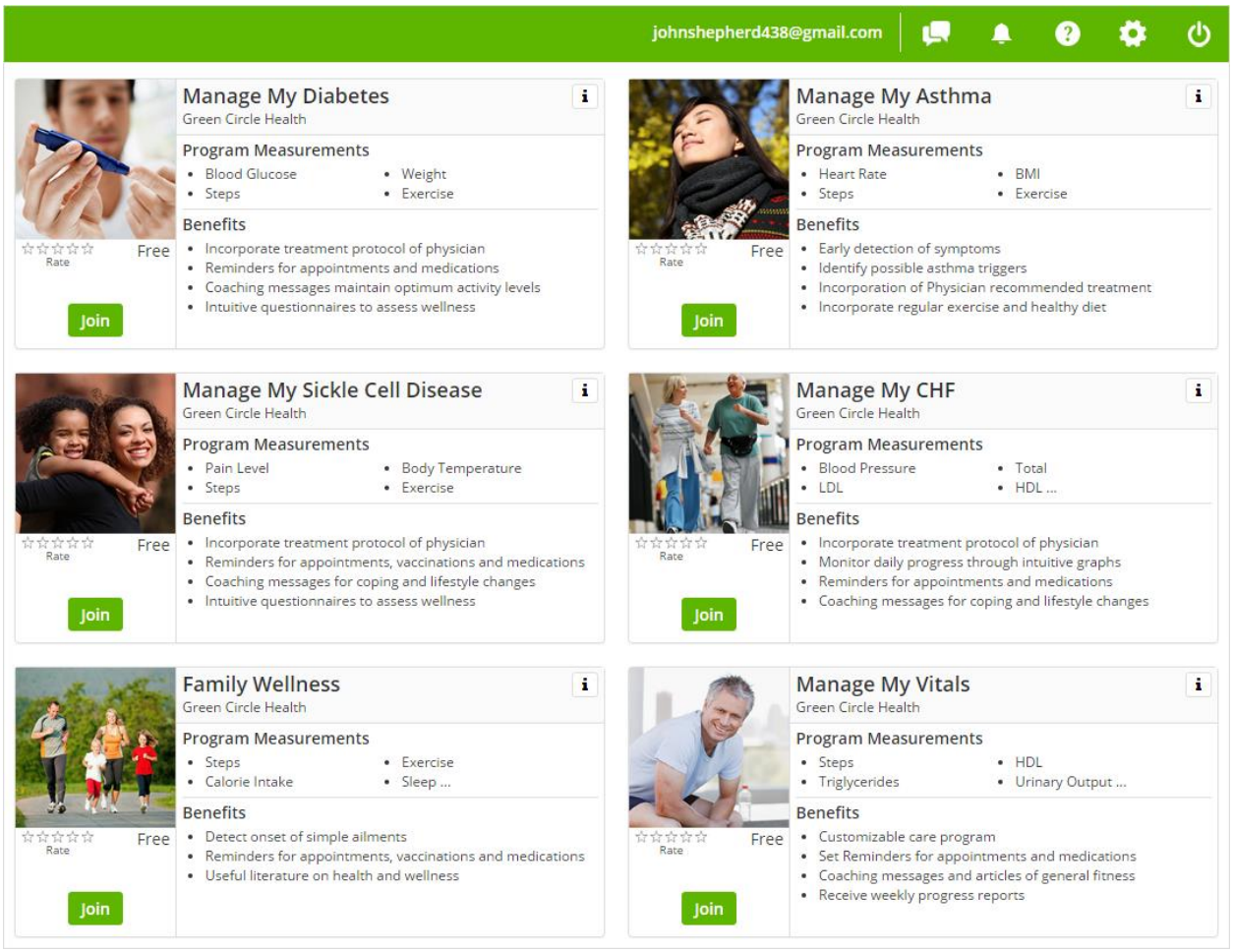


Figure 22: Listing of GCH Care Programs

In addition to self-managed care programs, a patient may enroll in a third party managed care program. For such program the care provider will define the treatment protocol and invite the patient to use the program. User upon accepting the terms of participation in such program will follow the protocol defined the care provider and care provider will have real-time access to the user progress as well as data and charts to help them manage their condition. In this case care provider may offer tele-health services along with rewards and group functions.

Figure 23a below shows the Care Program Dashboard for a GCH care program for a patient. Dashboard will show the summary and current status of the user in the program. It will also show charts for the vitals and questions that are tracked as part of the care program along with

articles, messages and notifications related to the program. Such care program will also send out weekly status update to users along with motivational message and guidance to keep improving their conditions.

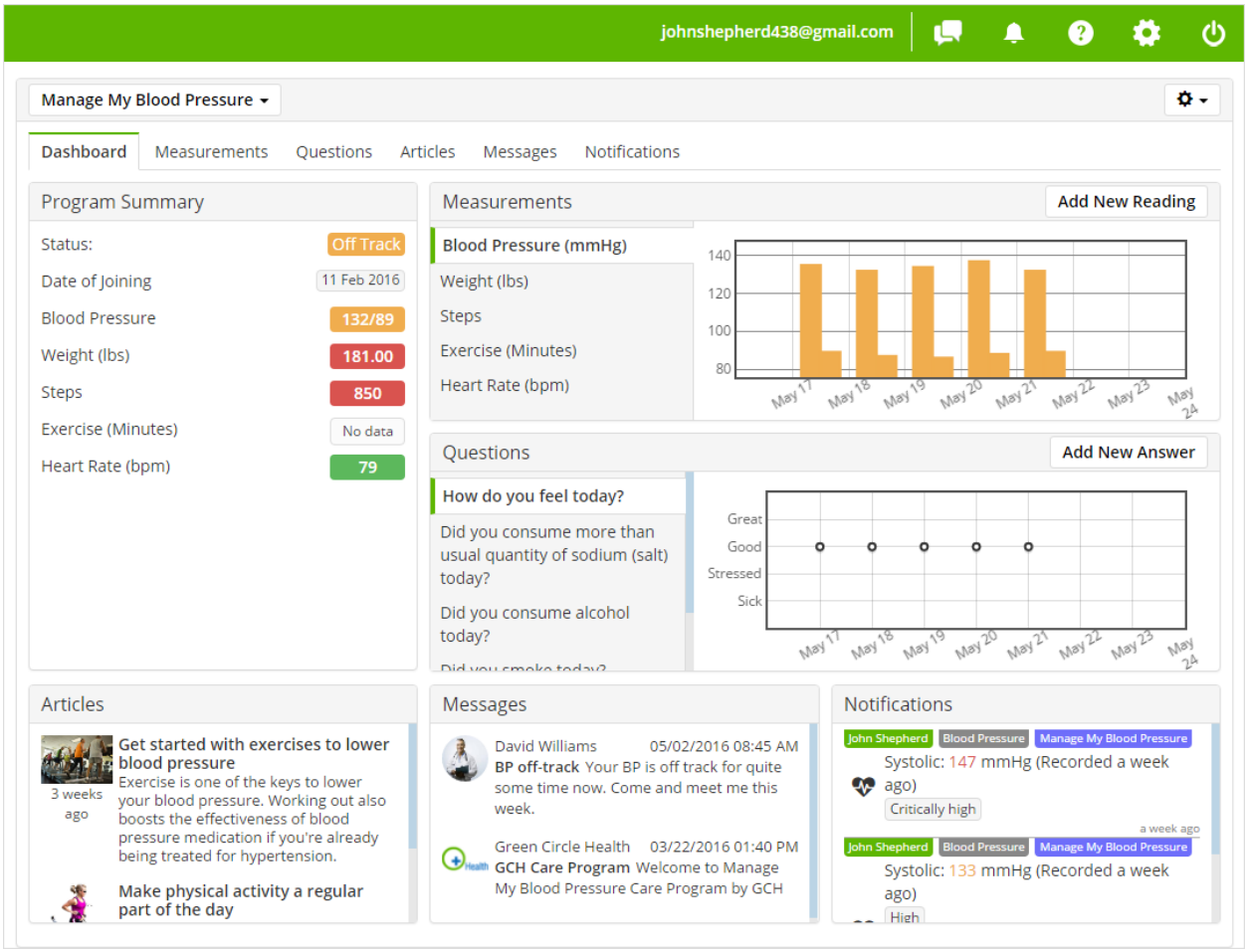


Figure 23a: GCH Care Program Dashboard

Figure 23b shows the Care Program Dashboard shown above as viewed in a smartphone.

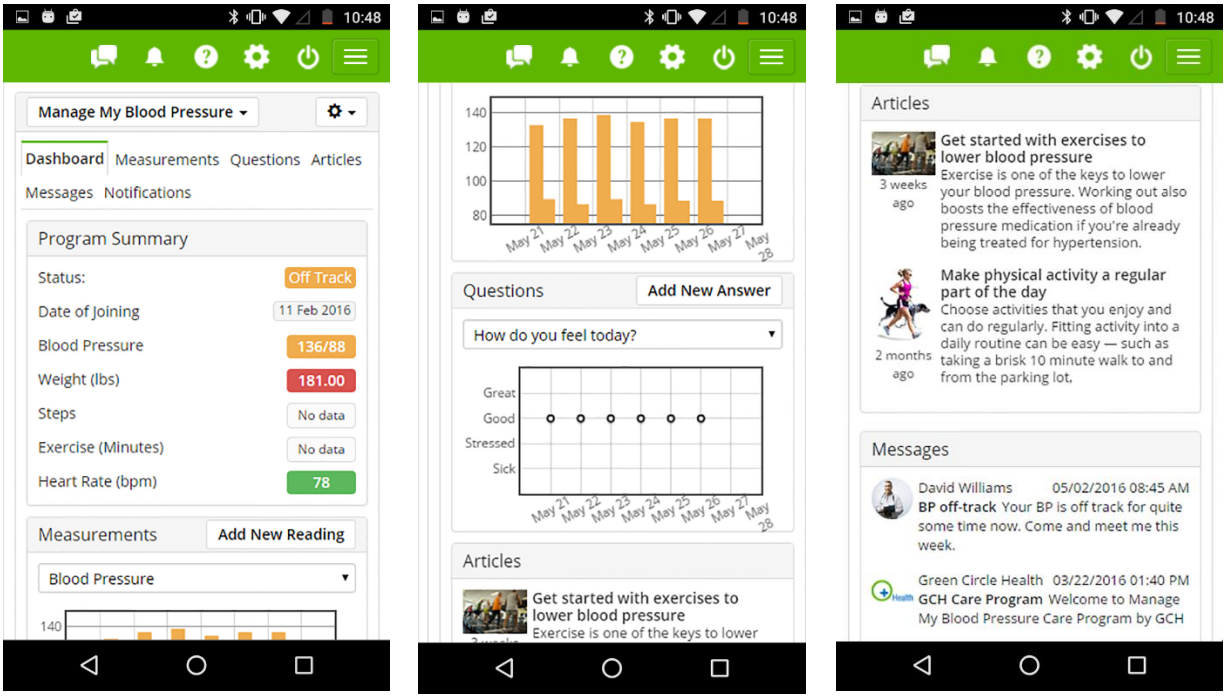


Figure 23b: GCH Care Program Dashboard (Smartphone View)

2.2.12 Sharing of Medical Data

GCH will allow users to share their medical records stored in the GCH platform, including health profile, vitals, documents, records downloaded from providers' EHRs, appointments, medications and care programs, with their physicians, care givers, family or any other person who has a GCH account with whom they wish to share the data. The sharing is done in a fully HIPAA compliant way where data is always encrypted at rest and encrypted in transit, and never leaves the system. All secure access is granted with proper authentication under business alliance agreements.

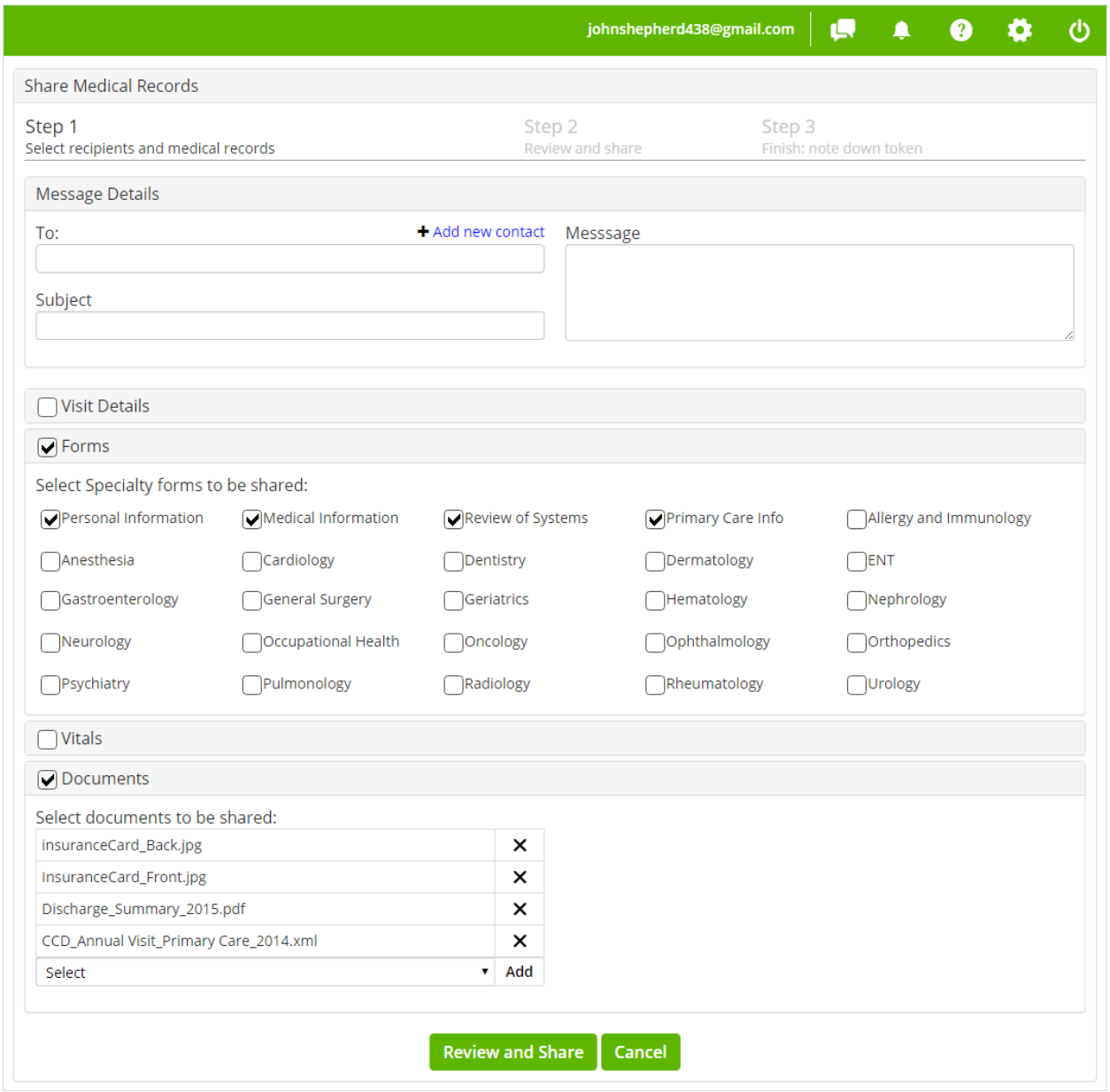


Figure 24: GCH Data Sharing Screen

While sharing data, users will have the option to select the data they want to share with each person and also assign read-only or edit access for the data being shared for a set amount of time. The data that is shared will only be accessible by the person with whom it is shared.

3 TECHNICAL SPECIFICATIONS

GCH Platform is being developed using Java, Bootstrap, MySQL and other open source technologies and the application will be hosted on HIPAA compliant secure Amazon Cloud - AWS. Consumer personal information and health information will be stored in encrypted databases. The web application will support various environments and form factors like smartphones, tablets, laptops and PCs. Native smartphone applications for both Android and iOS environments will also be developed with functionality to allow users to access their emergency profile, to review and record daily vitals and to answer health and lifestyle related questionnaires. However, no medical history and other personal information will be stored in the phone or tablet for user security and compliance with HIPAA requirements.

The GCH Platform will be compliant with the Health Insurance Portability Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act.

FHIR Draft Standard for Technical Use 2 (DSTU2) will be used to transfer patient data from EHR systems to GCH.

3.1 Product Architecture

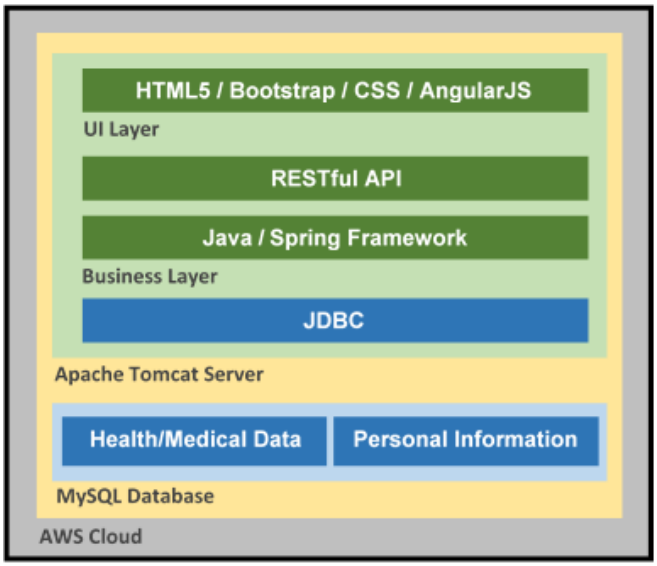


Figure 25: GCH Product Architecture

GCH will be developed using a multi-tier architecture. The UI layer is being developed using HTML5, Bootstrap, CSS, AngularJS and jQuery. The business layer will be implemented using the Java-Spring framework. The UI layer connects to the business layer through RESTful API. The application will be hosted on Apache Tomcat servers. MySQL database will be used as the storage layer. The users' personal data will be separated from the medical records within the database. For added security, all sensitive information stored in the database will also be encrypted. GCH platform will be hosted on a secure Amazon Cloud using Amazon Web Services (AWS).

3.2 GCH Interfaces

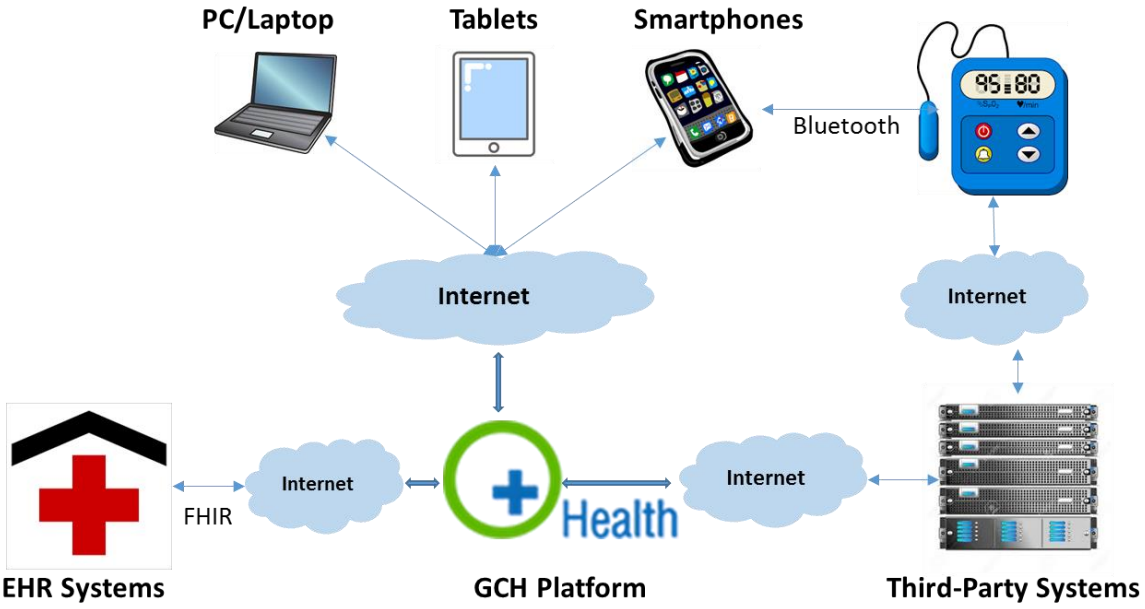


Figure 26: GCH External Interfaces

The GCH platform interfaces with a variety of other external systems. GCH users access the platform over the internet using secure SSL protocol from various types of devices like PCs and laptops to tablets and smartphones. GCH also interfaces with EHR systems implemented at various hospitals and other care providers. The communication between GCH and EHR systems will take place via SSL over the internet using FHIR Standards. In addition to the EHR systems

GCH will also interface with various other external systems using standard and proprietary secure communication channels.

3.3 Data and Information Security

The GCH platform will be fully complaint with HIPAA and HITECH Act to ensure data and information security. The service will be hosted in secure Amazon Cloud and the servers will be protected by firewalls and intrusion detection and prevention mechanisms.

The user data that is stored within GCH are hosted in robust and secure database servers. All sensitive data like medical records and other personal information of the users that is stored in the database will be encrypted and no GCH staff shall have access to the user data. Any development and support related activity shall be fully disclosed to specific user at the time of access if required for system maintenance.

User access to GCH platform will be restricted using multi-factor authentication which included username, password and an additional level of authentication using a challenge question and answer or a one-time password that will be sent to their cell phone or email. The users will have to select passwords that are strong (with a combination of alphabets, digits and special characters) and the users will have to change their passwords every 60 days.

While importing medical data from EHR systems, the patient record will be matched with the GCH profile of the user before data import is allowed to proceed. GCH will implement proprietary patient matching algorithms to match the patient records. The FHIR connection from the GCH platform to provider health IT system will use SSL protocol and will be authenticated using access credentials provided by the EHR systems.

4 BUSINESS PLAN

4.1 Business Description

The timing is right 'now' to make GCH a viable thriving business, achieving its vision to help millions of people live healthy lives while eliminating billions of dollars in healthcare costs. Once health related data is liberated from the controls of providers and payers and the consumer is truly empowered and engaged in personal health and wellbeing, the paradigm of health begins to shift from procedures and treatment to prevention and lifelong health. Behavioral changes and new ideas for a healthy lifestyle can be triggered using medical data and information from modern technologies. Today patients have too many patient portals that provide little, if any, value, and providers have EHR platforms that prevent the patient from engaging in their own care and being responsible consumers of healthcare. GCH changes this by bringing patients and their families to the center of healthcare. This allows families to focus on health and wellness and follow their care plan properly and thereby saving healthcare costs. Providers have a simple and effective way to participate in new payment models and gain efficiencies from a practical solution. The use of such a solution for payers, providers, and employers, will produce a return on investment that cannot be ignored by those who desire a more cost efficient healthcare system. Evolving market forces will help to accelerate such adoption making this a very successful business.

4.2 Value Proposition

This challenge enables GCH to bring patient health data to patients. However, in past many well-funded organizations like Google and Microsoft have tried to build a PHR – a patient health record based services since 2007 which have failed to get participation from patients and generate sustainable revenue or business. So the obvious question is "What will make this effort by GCH to bring patient health data to patients, a viable business?"

First and foremost are the market forces and regulatory changes. Second, it is the availability of technologies to accelerate and implement a new paradigm of health. And third, it is not a PHR that will make this happen but when patients and providers work together, the aggregated health data will become actionable information to bring the desired health outcomes. We will examine these forces in detail later in this section.

Green Circle Health will lower the cost of healthcare by improving patient health and making it possible to deliver healthcare at the doorstep of the patient. GCH will become the patient to provider communication gateway with remote monitoring capabilities to enable lifestyle changes and early detection of medical conditions as well as management of existing conditions. These services will be offered by payers – insurers and employers – to lower their overall costs making it a financially viable business which prior PHR solutions could not build as the technology, payment model advances and market forces were not there for them.

4.3 Company Background and Management

Green Circle Health was founded by its CEO who has a successful track record of building a software as a service business in a highly regulated industry. With his team of chief technology officer who has worked together for over 15 years and a chief medical officer who is a leading pediatric cardiologist and business development executive with a legal and business development background, GCH has the capacity to not only deliver the solution defined in this document but also has the experience to build a very successful business. The solution proposed here is an extension of work started by this team and addresses one of the main concerns expressed by potential users and buyers of such platform for difficulty of data entry, data aggregation, and data synchronization to generate value from medical data and create actionable information.

4.4 Market Opportunity

As provided above, there are three factors driving changes and making new opportunities for a company like GCH.

With the adoption of Affordable Care Act (ACA), and HITECH act and related changes in regulation and incentives, most of the major healthcare providers are now using certified health IT systems and most patient records are digitized. With over 20 million new insured patients and an insufficient supply of primary care providers, there are new incentives in place to make sure patients move towards preventive care and not rush to emergency rooms without proper justification. From pioneer Accountable Care Organizations (ACO) to next generation ACO, the success of such models depend on providers focusing on the whole life of a patient and not just procedures and episodic treatments at lower costs. A patient-centered care model is evolving with new focus on delivering care in more efficient ways. There is a focus to address patient care at home and at lower cost healthcare facilities where the appropriate care could be delivered; thereby, encouraging remote monitoring and telemedicine. With shared savings, comprehensive primary care and comprehensive primary care plus (CPC+) models, greater incentives are in place for care providers to engage in coordination of care and management of health and wellbeing of the patients. This creates an opportunity to build a platform that will engage families and patients to become responsible consumers of healthcare and focus on their own health.

From a technology point of view, smartphone penetration has reached 59.3% (2015) in the US market and 17.4 million activity trackers are estimated to be sold in 2016. Home medical devices and sensors for various health conditions have attracted a large portion of the 4.5 Billion Dollars (2015) of venture capital investment in health sector; and with precision health initiative millions of dollars are being invested in m-health initiatives. All these are creating an environment very different from what was encountered by early PHR vendors where patients did not have smartphones or easy availability of apps and data on the go or devices at home to engage in personal health. Sensor and device prices have become so cost effective, that now for a few hundred dollars you may have a home equipped like a hospital room. These technological advancements have removed the cost barrier, brought consumers and technologies together to make them well informed and energized about their personal health.

It is common for people to research their health conditions and health options on the Internet and become an informed consumer of healthcare.

Finally, there are applications like GCH proposed here, that will make it possible to take data from existing health IT systems (EHR, EMR, PMS) and break the silos of digital health records across multiple organizations and allow families to manage their own healthcare records, and augment those records with personal medical device data, activity data, and current health status or questions about their conditions. Such information will be analyzed by the system to provide virtual coaching and guidance and appropriate information could be routed to an expert for evaluation and consulting. This will create a delightful patient experience in dealing with the healthcare system as well as allow the care providers to provide more effective treatment to those who need it most, when they need it.

With these three factors converging, prevention will take precedence over billable procedures, and finally the cost curve of health and healthcare will bend. This will encourage insurers to support the initial expenses involved in deployment of such solutions including education, training and development of incentives to engage patients and providers.

4.5 Target Market

As explained above, given opportunities for keeping patients and their families healthy and reducing the cost of healthcare, the market for GCH may include:

- Healthcare Systems (Hospitals with Clinics)
- Clinics (Physician practices, Urgent Care, Walk in Clinics)
- Employers
- Insurers (Private, Government)
- Research Organizations (Academic Institutions, Pharma, Contract Research Organizations, CTMS)
- Technology Providers
- Direct to Consumers

However, given slow adoption cycle in healthcare industry and longer payout or benefit cycle of results from deployment of GCH platform, we propose to focus initially on two or three areas from this list with remote monitoring and chronic condition management for higher risk patients to realize quicker return on investment. This is because patients and families have to use the service for some duration before the costs of healthcare starts to come down, and patients and providers have to change their mode of interaction and behavior, which also takes time.

With above consideration our initial target market will consist of the followings:

- Insurers (Private, Government)
- Employers
- Research organizations (Academic institutions, Pharma, Contract Research Organizations, Clinical Trial Management Systems)

Following gives an overview of the size of these markets and our opportunity to achieve sustainable results in these areas.

Insurer Market

The government purchasers of health care, primarily Medicare and Medicaid, cover approximately 30% of the population. Medicare is the largest public purchaser of healthcare covering about 50 million people. Medicaid covers about 61 million residents and the Children's Health Insurance Program covered about 8 million children. The Affordable Care Act requires that private insurance plans cover recommended preventive services without any patient cost-sharing. Preventive services can save lives and improve health by identifying illnesses earlier, manage them effectively, and treating them before they develop into more complicated conditions.

Type of Health Plan	Number of People Insured Members
Private Health Plans	
Employer Plans	175M

Direct Purchase Plans	46M
Government Plans	
Medicare	50M
Medicaid	61M
CHIP	8M
Military Healthcare	14M

SOURCE: www.census.gov

The following are the top 5 private insurance companies based on revenue and their registered members.

Major Private Insurers	Members (Approx.)
United Health	70M
Anthem	38M
Aetna	52M
Humana	14M
Cigna	52M

SOURCE: Information from respective insurer websites

For GCH to achieve highest penetration in the market, we will work with the insurers to include the GCH platform as a part of their ongoing prevention, wellness and chronic condition management programs. For the government market, GCH will approach Medicaid Directors in their respective states (50 states, the District of Columbia and U.S. territories) to obtain their support for our platform. For Private Insurers, there is push and pull at state and corporate level and we will approach them at every level to partner with them in their customer base. Private insurers can provide GCH benefits to their members for wellness and coordination of care for chronic conditions subsequently improving health and reducing claims costs. The

primary objective of Medicaid Directors over the past couple of years have been the implementation of the Affordable Care Act, however in 2016, in a recent survey by the National Association of Medicaid Directors, many of them plan to focus on patient-centered homes, alignment of physical and behavioral health and population health which will to use of technologies like GCH to deliver the desired services and achieve costs savings.

Employer Market

GCH has identified the employer market as one of the early adopter especially those in self-insured category. Employers are increasingly offering programs for wellness and chronic conditions management for employees. It is commonly understood that employees are not self-motivated to make lifestyle changes to improve their health and wellness but with proper incentives and rewards from employers in coordination with health and wellness coaches and tele-health services, their behavior could be modified towards healthy lifestyle.

GCH intends to market to the employers the benefit of healthy work force and offer employees more accountable wellness programs and chronic conditions management programs, and offer employees a place to keep families lifelong medical records. Using GCH employers could offer greater rewards to employees when they achieve their goals and at the same time offer coaching and assistance to those who need more help to become healthier.

Employer-sponsored health coverage has been a vital component of the U.S. healthcare system. Sixty-one percent of the nonelderly population receives health insurance coverage from their employers. However, employers are struggling to provide insurance coverage as premiums have increased at higher rates than the cost of living index and salary compensations.

The following shows the employer market based on the number of employees.

Size (# of Employees)	Number of Firms	Total Insured
< 20	5,168,122	20,508,253
21 - 500	5,756,419	56,823,377

500-749	6,295	3,810,617
750-999	3,045	2,625,616
1,000-1,499	2,995	3,653,746
1,500-1,999	1,526	2,634,805
2,000-2,499	934	2,088,752
2,500-4,999	1,887	6,567,667
> 5,000	1,954	40,061,673

SOURCE: 2013 County Business Patterns (https://www.sba.gov/advocacy/firm-size-data)

GCH platform impacts the organizations in several ways:

- Increases employee engagement and participation through alerts and reminders
- Achieve lifestyle changes through constant feedback, coaching, and rewards
- Reduce healthcare and insurance costs with healthier workforce
- Flexible platform for lifelong storage of medical information and remote monitoring
- Ongoing interactions with care providers and health coaches or telehealth service
- Better productivity through healthy employees
- Fewer sick days
- Improves broadcast of health offers and announcements through secure messaging
- Improves health awareness wellness and chronic conditions through physician approved literature

Research Organizations

There are number of research projects in academic environments and research centers associated with health systems. Both clinical research and academic studies in medicine, pharmaceuticals and behavior sciences require subjects to follow a rigorous study protocol. From a clinical standpoint, chronic disease management sits at the center of the healthcare cost challenge given that these conditions account for a large and growing proportion of overall spend ($1.1 trillion annually, or one-third of total US healthcare expenditures). As the management and treatment protocols for chronic diseases get refined and reevaluated, the

technological advances in remote monitoring, medication adherence and new drugs allow researchers to develop new ideas that need evaluation and testing. As we continue to see a rise in personalized medicine and targeted therapeutics, development of specialty medications will also continue to grow.

A platform like GCH that improves interaction with research subject and deliver greater amount of field data with higher accuracy faster at a lower cost, starts to change the costs and time it takes to conduct research and it allows to expand such trials to a larger population. GCH may partner with drug makers who conduct many clinical trials and studies to develop precision health medicine to reduce trial costs and improve research project success. GCH will help clinical trial participants to adhere to trial protocol and increase reliability of data. With simpler service, researchers will be able to recruit and train more patient and providers easily. Financial pressures have pushed research organizations to identify areas where some technologies can provide budget relief while still maintaining a high standard of research quality. The use of remote patient monitoring and telemedicine can meet these demands by reducing operational costs, improving the safety of the trials and increasing the amount of data collected.

Study and Intervention Type	Number of Registered Studies
Drug or Biologic Studies	80,825
Behavioral Studies	49,524
Device Studies	19,426
Intervention Studies	174,023

Registered studies in US and around the world registered with www.clinicaltrials.gov

Approximately two-thirds of CRO business is funded by the pharmaceutical industry, 27 percent from biotech, and the rest by the medical device, foundation and government sectors.

GCH has identified the following market to target sales and marketing efforts:

Company Type	Number of Companies
Pharmaceutical	201
Bio Tech	235

Health Devices	40
Foundations	20
Medical Research Institutes	108

GCH platform can impact the clinical research/study/trials as follows:

- Investigator dashboard to monitor participation and compliance with protocols
- Easy to setup and deploy a study or a trial with specific protocol
- Easy for subject/patient to collect data and report outcomes
- Gather consistent high-quality data in real-time
- Improve adherence to trial/research protocols
- Faster patient recruitment with secure informed consent and forms
- Distribute relevant literature, instructions, and messages
- Higher quality of data and participation at lower costs for such studies/trials

4.6 Business Viability and Sustainability

GCH will distribute the service through both direct and indirect distribution channels. GCH will directly work with large insurers and employers to offer this platform to employees and insured members. For smaller employers – less than 1,000 employees – GCH will partner with benefits consultants and third party agents who specialize in health and benefits for employers. GCH will consult with employers and structure wellness and care programs with proper incentives and rewards using the GCH platform to serve their needs. In the insurance space, GCH will work with insurers that sell through market place, as well as work with those who participate in managed care programs for Medicaid population, CHIP programs and advantage programs for Medicaid population. Such organizations when involved in new risk-based payment models will become early adopter of such services.

In indirect channels, GCH will work with distributors and technology providers who will see great benefits from adding GCH to their portfolio. For example, to reach out to VA and DoD

hospital systems, GCH is in discussion with a veteran run entity which has GSA contracting vehicle and knowledge to deliver such solutions to government and military organizations. For clinical trials and research studies, GCH will approach research directors directly at large academic centers as well as work with some professional associations in different verticals to develop niche in certain medical areas at the same time offering a flexible platform that may work across many different areas. For example, American Pediatric Association promotes Bright Futures program which can be deployed with GCH platform. For smaller research centers and clinical trials, GCH may partner with Clinical Trial Management System vendors who typically will not have as comprehensive view of patients and as much access to patient generated outcomes that GCH could provide for their clients. In all these areas, both direct and indirect channel opportunities exist for GCH to rapidly grow its distribution capabilities.

4.7 Revenue Model

GCH will follow a software as a service (SaaS) revenue model. GCH revenues are derived from employers or member organizations and the primary revenue driver is the number of users. Typical deployment will have a small one-time setup or installation fee, annual maintenance or hosting fee and per member per month (PMPM) usage fees. Within a given organization, as the user volume grows, total revenue will grow but per user costs will decline. When the service is deployed by an employer with greater focus on wellness for all employees, per user revenue will come towards the lower end of our range. While in a research study for a small population with multiple complex conditions management, using remote monitoring and care plan coordination, the per user revenue will trend towards the higher end of PMPM range. In a consumer direct model, the initial revenue from per user per month will be modest but overall revenue will grow substantially as number of users grow over time. However, this sector will initially encounter the higher cost of distribution or user acquisition as healthcare services like this are unlikely to go viral through consumer social media. While GCH could work on a shared savings incentive model for insurers and employers, and that would be very profitable for both parties, in healthcare industry there is reluctance to such approach as it is perceived to be

difficult to measure and allocate successful outcomes to specific interventions. It is possible that some insurers as well as government organization may consider offering GCH to all their members for reducing costs for entire population with a goal to improve health and realize benefits over time. This could lead to explosive growth beyond what is forecasted in our business model.

4.8 Marketing Strategy

In addition to identifying the markets for GCH, it is very important that the marketing strategy and tactical plan are clearly defined. GCH intends to showcase its platform at key conferences in the US. Following is a list of some of the conferences that may be worth showcasing our platform.

- Digital Health Conference
- Digital Health Summit
- Government Health IT Summit
- HIMSS Annual Conference and Summit
- National Healthcare Innovation Summit
- Mayo Think Big Challenge and Clinic Transform
- mHealth Summit
- ONC Annual Meet
- DataPalooza
- American Telemedicine Association Annual Conference
- AMA Annual Conference
- Specific Specialty Conferences

Networking contacts made through seminars, conferences and meets can be capitalized further to market through email, follow up meetings and social media contacts.

GCH intends to use social media to effectively promote its marketing efforts. Twitter and LinkedIn are focused platforms to give mileage for ideas, stories and product information to probable customers and key personnel in organizations.

GCH can promote video tutorials over YouTube that educates the customer on the features of the GCH platform. GCH can take part in media discussions on the current health IT scenario and promote articles and media advisories on relevant subjects through media partners and agencies. The GCH product that we envision can help millions of people and this is the message that we wish to resonate in in the media publications like Physicians Digest and Hi-Tech Answers.

GCH wishes to onboard several sales and marketing personnel as per the staffing plan to concentrate on the different market sectors across the US. Our platform is not only a value addition for the US customers but also would work in other countries who need to take advantage of latest advances in remote monitoring and tele-health for better outcomes.

GCH as a patient to provider platform, brings its biggest benefits when it helps change the attitudes of people from episodic care to preventive care. We think that targeting hospital systems with an over extended work force will be harder than an employer focused on engaging employees using rewards and other incentives for participating in care programs will let us have a head start before working on a consumer direct model. These early users will provide us with valuable feedback to improve our products and value proposition. Once the product starts picking up usage, GCH can target its marketing effort to roll it out to the hospital systems and to its patients.

To engage customers, the platform will not only provide easy modern device dependent experience but will also provide virtual and live coaching as appropriate. GCH messaging with chat and video capability will bring them back to the service for more health related interaction

making it part of their daily lives. GCH will also enable social component of building fitness or wellness challenges among peers or family members.

4.9 Revenue

4.9.1 Market Penetration

The following table shows the potential market sizes and the estimated market penetration for the first 3 years of operation.

Organization Type	#of Org.	# Users (Avg.)	Setup Fee	Annual Fee	Usage Fee /User/Month	Projected Market Penetration		
						Year 1	Year 2	Year 3
Private Insurers	5	35,000,000	$500,000	$100,000	$2	0.250%	0.700%	2.500%
ACO/MCO	433	18,000	$25,000	$5,000	$4	1.000%	1.500%	5.000%
Small Employers (0-500 Emp.)	11,000,000	7	$0	$0	$5	0.000%	0.500%	1.500%
Medium Employers (501-2000 Emp.)	14,000	900	$10,000	$2,000	$4	0.100%	0.750%	2.250%
Large Employers (> 2000 Emp.)	4,600	10,000	$25,000	$5,000	$2	0.250%	0.850%	2.500%
Research Organizations	1,200	250	$25,000	$5,000	$17	1.000%	2.000%	4.000%
Consumer Direct	1	120,000,000	$0	$0	$8	0.050%	0.250%	0.550%

4.9.2 Revenue Projections

Based on the estimated market penetration numbers, the projected revenues for 3 years is shown in the table below.

Organization Type	Year 1 Revenues				Year 2 Revenues				Year 3 Revenues			
	Setup Fee	Annual Fee	Usage Fee	Total Rev.	Setup Fee	Annual Fee	Usage Fee	Total Rev.	Setup Fee	Annual Fee	Usage Fee	Total Rev.
Private Insurers	0.01	0.00	0.88	**0.88**	0.02	0.00	2.45	**2.47**	0.06	0.00	8.75	**8.82**
ACO/MCO	0.11	0.00	0.31	**0.42**	0.16	0.02	0.47	**0.65**	0.54	0.03	1.56	**2.13**
Small Employers	0.00	0.00	0.00	**0.00**	0.00	0.00	1.93	**1.93**	0.00	0.00	5.78	**5.78**
Medium Employers	0.14	0.00	0.05	**0.19**	1.05	0.03	0.38	**1.46**	3.15	0.21	1.13	**4.49**
Large Employers	0.29	0.00	0.23	**0.52**	0.98	0.06	0.78	**1.82**	2.88	0.20	2.30	**5.37**
Research Organizations	0.30	0.00	0.05	**0.35**	0.60	0.06	0.10	**0.76**	1.20	0.12	0.20	**1.52**
Partner/Direct	0.00	0.00	0.48	**0.48**	0.00	0.00	2.40	**2.40**	0.00	0.00	5.28	**5.28**
Total Revenue	0.84	0.00	2.00	**2.84**	2.81	0.17	8.50	**11.48**	7.83	0.56	25.00	**33.39**

All amounts in Million USD

4.10 Expenditure

4.10.1 Assumptions

In order to achieve the market penetration and revenues estimated in the previous section, the estimated number of employees that will be required and the corresponding payroll expenses for the first 3 years is shown in the table below.

Employee Type	Year 1			Year 2			Year 3		
	# Emp.	Avg. Salary	Payroll	# Emp.	Avg. Salary	Payroll	# Emp.	Avg. Salary	Payroll
Management	3	150,000	450,000	5	175,000	875,000	5	200,000	1,000,000
Marketing	2	60,000	120,000	4	70,000	280,000	4	75,000	300,000
Sales	10	100,000	1,000,000	15	110,000	1,650,000	20	120,000	2,400,000
Technical	12	100,000	1,200,000	18	105,000	1,890,000	22	115,000	2,530,000
Support	8	75,000	600,000	17	80,000	1,360,000	25	85,000	2,125,000
Admin/Ac	2	45,000	90,000	3	50,000	150,000	4	55,000	220,000
Total	**37**	**93,514**	**3,460,000**	**62**	**100,081**	**6,205,000**	**80**	**107,188**	**8,575,000**

4.10.2 Estimated Expenditure

In addition to the payroll expenses GCH would also incur other expenses for its operations. The total estimated expenses for 3 years is shown below.

Expense Type	Year 1	Year 2	Year 3
Payroll	3.46	6.21	8.58
Benefits	1.14	2.05	2.83
Marketing	0.03	0.11	0.33
Sales	0.14	0.57	1.67
Travel	0.03	0.11	0.33
Consultants	0.40	1.00	1.50
Operations	0.30	0.60	1.20
Rent	0.09	0.16	0.22
Office Expenses	0.04	0.07	0.11
Conferences	0.06	0.09	0.13
Miscellaneous	0.06	0.09	0.12
Total Expenses	**5.74**	**11.07**	**17.03**
			All amounts in Million USD

4.11 Profit & Loss

As per the revenue and expense projections explained in the previous sections, GCH is expected to become a profitable business in the third year of operation. The P&L projections for 3 years based on the projected revenue and expenditure is shown in the table below.

Year	Revenue	Expense	P/L
Year 1	2.84	5.74	**(2.90)**
Year 2	11.48	11.07	**0.41**
Year 3	33.39	17.03	**16.37**
Total	**47.71**	**33.84**	**13.87**
			All amounts in Million USD

4.12 Conclusion

The GCH platform will help to solve the problems that many consumers have today – the ability to easily and electronically access their health data from different health care providers that use a variety of different health IT systems. With data aggregation, real-time analysis and virtual coaching, they will become well informed consumers of healthcare services. For the first time patients will feel they are in control of their medical information and become responsible for their own health. Maintaining a health repository on GCH will help them get involved in ongoing dialogue to optimize the health and partner with care providers. GCH presents a much needed option to liberate data and derive benefits from digitization of health records in a commercially viable way.

5 APPENDIX A: PROVIDER HEALTH IT SYSTEM DATA SOURCES

GCH has contacted a number of healthcare providers as part of the Consumer Health Aggregator Challenge to connect to their EHR systems and import the data from them into users' GCH account. Some of the providers have responded positively to GCH and are in the process of signing a letter of interest to work with GCH to build new platform and share their knowledge for this Challenge. The following section shows four healthcare providers who have offered GCH a letter offering their support to GCH in this Challenge. As anticipated by HHS and discussed during last few months, one of the biggest barrier to consumer in getting their data remains lack of cooperation from health systems to openly share this data. We are still working, but do not have confirmation from health systems with three of the top ten health IT platforms to list them here. As this standards based interface could improve the technical process, there are still barriers for third party platform like one being proposed here and consumers to readily access their data.

We have partnered with a set of healthcare providers and insurers who are most likely to help build a community of care delivery organizations, see the benefit of liberating patient data, use such service and are likely to be early adopters.

We welcome any and all the help HHS may provide so that to get patient their own data from health systems, the application like GCH should not be signing a one on one agreement with each healthcare system through such a letter of intent. Any consumer should be free to go to any healthcare systems with any of top 10 or any other certified health IT system, and get the data through this FHIR interface in GCH type platform. If each third party developer has to do one-on-one interface, the benefits of such deployment will be slow and limited and patients will not have data liberated for their benefits and they will not use such platforms.

5.1 Christ Community Health Services

Christ Community Health Services (CCHS) is one of the largest Christian Health Centers in the nation and the largest primary healthcare provider in Shelby County, TN. Their health centers

server over 57,000 patients with over 162,000 visits annually. Christ Community delivers medical care to highly disadvantaged population with very limited resources. Christ Community recognizes that aggregating medical data from various healthcare providers would help their patients in managing chronic conditions more effectively. Their patients move in and out of CCHS care and go to other major health systems in the area. The local Health Information Exchange has not worked for them.

5.2 Magnolia Health

Magnolia Health is a long-term solution to help the State of Mississippi enhance care for Medicaid recipients while most effectively managing Medicaid funds. Magnolia is one of the two coordinated care organizations the Mississippi Division of Medicaid has contracts who are responsible for providing services to the Mississippi Medicaid beneficiaries who participate in the MississippiCAN program. Magnolia also servers CHIP members. Magnolia is backed by its parent company, Centene Corporation, which has over 25 years of experience in Medicaid and other government programs. Magnolia believes that by allowing patients to play an active role in managing their health and to aggregate and share medical records when they visit new providers, it will help them to ensure proper continuity of care and better outcomes. Magnolia works with health systems and providers who are part of the Mississippi Coordinated Access Network (CAN)

5.3 Peyton Manning Children's Hospital

Peyton Manning Children's Hospital offers family-centered care that is focused on the unique needs of children and family. They are dedicated to providing extraordinary patient care for the children of Indiana. The hospital offers 24-hour physician coverage in various specialties and provides complete continuum of care to children of all ages, from new born to late adolescents.

By implementing the solution proposed by GCH, Peyton Manning Hospital will be able to get the children with various chronic conditions and their families more engaged in the care plan and thereby improve over health of the patients and reduce adverse outcomes.

5.4 Lebanon Pediatrics

Lebanon Pediatrics is a private practice for the children in the Lebanon area in Indiana. Lebanon is a small town of about 15,000 residents located 25 miles from major health center of Indianapolis IN. This independent practice with its E-MD platform provides a unique opportunity to explore use of our system in rural setting. By enabling patients to aggregate medical data from various providers when they visit specialists in other areas and share that information with their primary care pediatrician at the Lebanon Pediatrics, they will be able to ensure proper coordination of care for the children. And as these children grow up and move to college towns, they will be able to take their own medical records with them where ever they may choose to attend college and settle down.

6 APPENDIX B: LETTERS OF INTENT FROM HEALTHCARE PROVIDERS

6.1 Christ Community Health Services

Christ Community
HEALTH SERVICES

May 23, 2016

Dinesh Sheth
Green Circle Health

(Sent via Email)

As I understand, Green Circle Health (GCH) is proposing to build an application in response to the Consumer Health Data Aggregator Challenge by the Department of Health and Human Services (HHS). This application will solve the problem that many consumers have today – the ability to easily and electronically access their health data from different health care providers using a variety of different health IT systems. GCH solution will also address the second HHS challenge initiative for Provider User Experience that will create health provider apps that sync consumers' data.

Christ Community is one of the largest Christian Health Centers in the nation and the largest primary healthcare provider in Shelby County, Tennessee. Combined, our health centers serve over 57,000 patients with over 162,000 patient visits annually. At each of our centers, our staff works with the patients and the community to actively address health issues within the areas severed while serving as a resource for health education and community support. Christ Community Health Services is an FTCA deemed facility.

With focus on primary care, aggregating medical data from various service providers is important to our medical service providers. An application that enables patients to play an active role in managing their health and allows them to take their medical data with them when they see a new provider helps to ensure continuity of care for patients with chronic diseases. Our patients are referred to local specialists and hospitals where such service will be very helpful to patients and providers.

GCH participating in this HHS driven initiative and working together with other systems will allow GCH to build a platform for patient centered care. GCH will be developing and testing this application working with our staff that will have an opportunity to interact with the GCH platform and provide direct input to improve workflow and its practical utility for patients and case managers.

Christ Community delivers medical care to a highly disadvantaged population with very limited resources. When such a platform is ready for deployment, we see an opportunity to benefit our patients and community; however, we will need to find financial sponsor to support such an effort for entire community. We see our involvement with the company at this stage as a mutually beneficial partnership in the community. We look forward to help you with these HHS Challenge opportunities.

Sincerely,

Edwin Roberson
Chief Executive Officer
Christ Community Health Services

6.2 Magnolia Health Plan

magnolia health

111 E. Capitol St.
Suite 500
Jackson, MS 39201

May 23, 2016

Dinesh Sheth
Founder & CEO
Green Circle Health

(Sent via Email)

As I understand, Green Circle Health (GCH) is proposing to build an application in response to the Consumer Health Data Aggregator Challenge by the Department of Health and Human Services (HHS). I believe that the proposed application could solve a problem that many consumers have today - the ability to easily and electronically access their health data from different healthcare providers using a variety of different health IT systems. GCH's solution will also address the second HHS challenge initiative for Provider User Experience by creating health provider apps that sync consumers' data.

Magnolia Health (Magnolia) is a long-term solution to help the State of Mississippi enhance care for Medicaid recipients while most effectively managing Medicaid funds. Magnolia is backed by its parent company, Centene Corporation, which has over 25 years of experience in Medicaid and other government programs.

Using activity trackers, at-home medical devices and smartphones, some of our members have begun collecting data outside of clinical settings. Merging this data with clinical data across different providers will improve coordination of care for patients and providers. An application that enables patients to play an active role in managing their health and allows them to take their medical data with them when they see a new provider helps to ensure continuity of care for patients with chronic diseases.

GCH's participation in this HHS driven initiative and work with other systems will allow them to build a platform for patient centered care. Pending Mississippi Division of Medicaid approval, Magnolia intends to partner with GCH in its effort to develop and test this application. As a part of this engagement, Magnolia will have an opportunity to interact with the GCH platform and provide direct input to improve workflow and practical utility for patients and case managers. When this platform is ready for deployment, we believe that it will provide a real benefit to our members. We look forward to helping you in any way we can with these HHS Challenges.

Sincerely,

Aaron R. Sisk
President & CEO
Magnolia Health Plan

6.3 Peyton Manning Children's Hospital

Peyton Manning
Children's Hospital
St. Vincent

8333 Naab Road, Suite 320
Indianapolis, IN 46260
(317) 338-3000 Phone
(317) 338-5057 Fax
stvincent.org/peytonmanning

May 26, 2016

To,
Mr. Dinesh Sheth
Green Circle Health

Dear Mr. Sheth:

It is my understanding that Green Circle Health (GCH) is proposing to build an application in response to the Consumer Health Data Aggregator Challenge by the Department of Health and Human Services (HHS). This application will solve the problem that many consumers have today – the ability to easily and electronically access their health data from different health care providers using a variety of different health IT systems. It is also my understanding that the solution proposed by GCH will also address the second HHS challenge initiative for Provider User Experience that will create health provider apps that sync consumers' data.

Children's Heart Center at St. Vincent Hospitals, Indianapolis is part of a multi-speciality physician group – the St. Vincent Medical Group. The Children's Heart Center includes four physicians, cardiothoracic surgeon and nurse practitioners. We are a very sizable program and our physicians generate about 30,000 work RVUs every year. We also have seven satellite offices across the state of Indiana.

We participate in the care of children and adults born with complex congenital heart disease who often have multiple congenital anomalies or multi-system health problems and therefore receive care from several health care providers. Due to our focus on tertiary and quaternary care in pediatric cardiology, aggregating medical data from various other service providers is important to us. An application that enables patients to play an active role in managing their

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stvincent.org/peytonmanning

health and allows them to take their medical data with them when they see a new provider will help ensure continuity of care for patients with such chronic diseases.

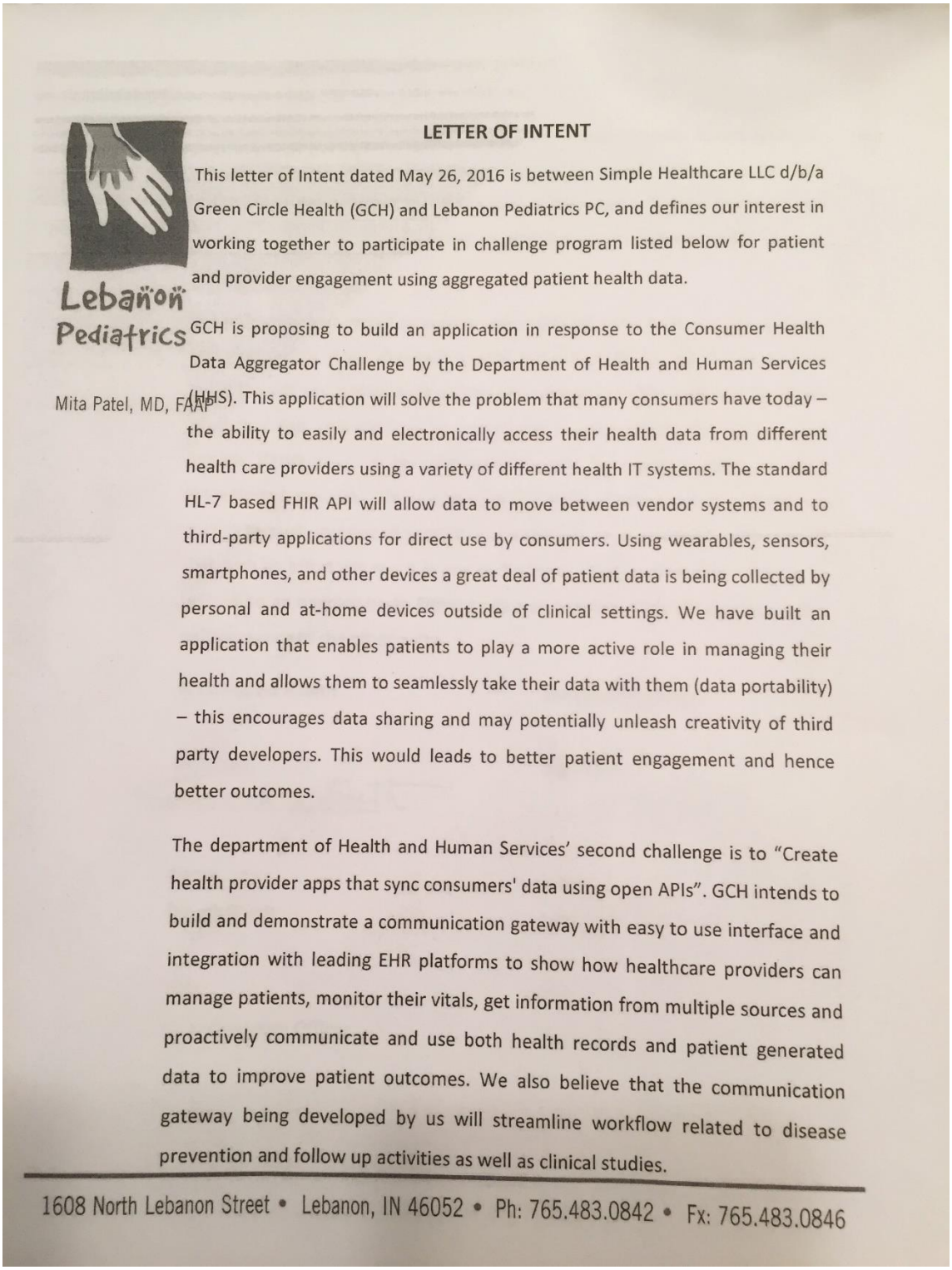
We currently use the AthenaHealth electronic health record platform. We envision that GCH participating in this initiative and working together with other like-minded systems across the state and beyond, will allow improvements in patient centered care with better engagement among patients and healthcare providers. This letter confirms our intent to participate with GCH in developing and testing this application. We envision that our staff will have an opportunity to interact with the GCH platform and provide direct input to improve workflow and its practical utility for patients and their caregivers.

Children's Heart Center delivers medical care to a highly complex subset of patients, some of whom have very limited resources. When such a platform is ready for deployment, we see an opportunity to benefit our patients and community at large. We see our involvement with the company at this stage as a mutually beneficial partnership that will help us improve patient care. We look forward to helping you with these HHS Challenge opportunities.

Sincerely,

Sanjay Parikh, MD
Medical Director, Pediatric Cardiology
St. Vincent Hospitals, Indianapolis.

6.4 Lebanon Pediatrics



Lebanon Pediatrics

Mita Patel, MD, FAAP

LETTER OF INTENT

This letter of Intent dated May 26, 2016 is between Simple Healthcare LLC d/b/a Green Circle Health (GCH) and Lebanon Pediatrics PC, and defines our interest in working together to participate in challenge program listed below for patient and provider engagement using aggregated patient health data.

GCH is proposing to build an application in response to the Consumer Health Data Aggregator Challenge by the Department of Health and Human Services (HHS). This application will solve the problem that many consumers have today – the ability to easily and electronically access their health data from different health care providers using a variety of different health IT systems. The standard HL-7 based FHIR API will allow data to move between vendor systems and to third-party applications for direct use by consumers. Using wearables, sensors, smartphones, and other devices a great deal of patient data is being collected by personal and at-home devices outside of clinical settings. We have built an application that enables patients to play a more active role in managing their health and allows them to seamlessly take their data with them (data portability) – this encourages data sharing and may potentially unleash creativity of third party developers. This would leads to better patient engagement and hence better outcomes.

The department of Health and Human Services' second challenge is to "Create health provider apps that sync consumers' data using open APIs". GCH intends to build and demonstrate a communication gateway with easy to use interface and integration with leading EHR platforms to show how healthcare providers can manage patients, monitor their vitals, get information from multiple sources and proactively communicate and use both health records and patient generated data to improve patient outcomes. We also believe that the communication gateway being developed by us will streamline workflow related to disease prevention and follow up activities as well as clinical studies.

1608 North Lebanon Street • Lebanon, IN 46052 • Ph: 765.483.0842 • Fx: 765.483.0846

Lebanon Pediatrics

Mita Patel, MD, FAAP

Lebanon Pediatrics currently uses the e-MDs electronic health record platform. We envision that GCH participating in this initiative and working together with other like-minded systems across the state and beyond, will allow improvements in patient centered care with better engagement among patients and healthcare providers.

While both parties intend to make a reasonable effort to build and demonstrate the platform in time allocated by HHS for the challenge, all the application development and testing work will be responsibility of GCH. Lebanon Pediatrics physicians and staff will have an opportunity to interact with the platform and provide direct input to improve workflow and its practical utility for their patients and providers. This is a non-binding letter of intent between these two parties through the rest of year 2016 and there is no guarantee by either party that such an effort will result in any particular product, service or solution to be utilized on an ongoing basis. Either party may terminate this LOI anytime with a written notice to the other party.

Green Circle Health

Signature: Dinesh Sheth

Name: Dinesh Sheth

Title: Chief Executive Officer

Lebanon Pediatrics

Signature: M Patel

Name: Mita Patel, MD

Title: President

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