

hGraph Roadmap

<https://hgraph.org/>

2 Tracks for hGraph

1. hGraph as a data visualization tool
 - a. Open source repo
 - b. Repo is the front-end rendering tool
 - c. Others customize to suit their needs by deciding on: context (DR, Patient, etc), health metrics, healthy ranges – however, the tool will provide sensible defaults
 - d. Similar to D3 <https://d3js.org>, <https://github.com/d3/d3> (note: hGraph uses D3)
2. hGraph as a service/product (do we need better naming to differentiate the two tracks, repos?)
 - a. Open source repo
 - b. Live for anyone to sync their health data and populate hGraph
 - c. On the iOS app store (to start)
 - d. Syncs with HealthKit to populate hGraph
 - e. We decide on the context (Patient), health metrics, and healthy ranges to display
 - f. Similar to Apple Health app, CommonHealth app

Tasks: Research, Design, Engineering, Community, Business

Research

Objectives

- Provide evidence-based defaults to make the hGraph service fully functional on day 1 – just connect to your data source and it works (or even better, we provide hGraph fully connected to Synthea as a default data source)

Part A: Key Metrics (hMetrics)

- Define the key metrics to display on hGraph for general health (patient point-of-view)
 - Research key metrics for general health, document sources
 - Validate with HCP's
 - Should be designed to be customized by other organizations

Part B: Healthy Ranges (hRange)

- Define healthy ranges model for the most common metrics (as a start)

- Without these defaults, hGraph doesn't function and we're forcing people to create these to make hGraph function properly
- Document our sources for healthy ranges of each metric
 - What ranges do organizations use? What about lab companies? What about ranges in FHIR (some metrics have this)?
 - Handling of multivariate ranges – by age, sex
 - A future iteration/version we could research tweaks made by a provider for an individual, variations by month/day, or other variables
- Should be designed to be customized by other organizations

Part C: DoH View

- What does a DoH view of someone's health look like with hGraph?

Part Z: hScore (future)

- Define hScore algorithm
 - Research others that have done similar (ex. Military/DoD, Insurance Actuaries)
 - ~~Break out into its own repo~~
 - Should be designed to be customized by other organizations
 - Some very rough thoughts:
https://www.dropbox.com/s/j6346r9mt1w70dw/hScore_v03.pdf?dl=0
 - hGraph can be used with hScore

Design

Objectives

- To provide multiple levels of data exploration and design for any gaps (list?)
- Update the website to better describe, sell, and onboard
- Design playbook on hGraph best practices
- MVP design (?) for launching to iOS App Store

Part A

- hGraph Detail View
- Support the varying information coming in from a FHIR STU3 profile
- Beautiful interactions between the views

Part B

- Website revamp
- Adding fun and playful experiences
- Technical diagram
- Feedback testing + plan
- Health Picture ideas... ?

Part C

- Population sizes (1 to many – patient, doctor, hospital, city, state, country, planet)

hGraph Components



hMetric

Set of health metrics to be displayed on the hGraph. A default set is provided but can be tailored to your installation.



hRange

Defines the healthy range for hMetrics. A default set is provided but can be tailored to your installation.

```
<json>
  <health>
    <metric>
  </health>
</json>
```

Data Set

Bring your FHIR STU3 compatible data set to populate hGraph. A synthetic data set is available for development using Synthea.

56

hScore (optional)

An overall score of a person's health. A default hScore algorithm is available but can be tailored to your installation.

Engineering

Objectives

- To grease and increase the adoption of hGraph in 3rd-party services.
- Repo provides easy-to-follow steps for running hGraph locally in a fully rendered form.
- To gain first-hand experience launching a service with FHIR, PHI.
- To launch a GoInvo service that anyone can use which will increase the studio's reputation and credibility.

Round 1: FHIR-Friendly

A. Display hGraph (Level 1/Main View) using data in FHIR STU3

(<https://www.hl7.org/fhir/profiling.html>)

- Ability to define specific metrics (hMetrics) to display on hGraph
 - hGraph will not display every metric from a patient's data set so we need to have the ability to select a subset of metrics that is the most important to display.
 - The hGraph repo will provide a default set of hMetrics BUT we should develop this in a way that's easily customizable for each site installation (ex. MGH, Mayo Clinic) as others may have different opinions on what's most important to show on hGraph.
 - Future: You can imagine hMetrics evolving over time with the patient based on their situation. A few examples could be: Primary Care hMetric Profile, Type II Diabetes hMetric Profile.
- Ability to define a healthy range (hRange) for each hMetric (where applicable) in the FHIR profile
 - GoInvo will provide the research for the first set (10?) of healthy ranges. This will then need to be codified in code.
 - Include the source (url?) for the healthy range in the JSON?

- iii. The hGraph repo will provide a default set of hRanges BUT we should develop this in a way that's easily customizable for each site installation (ex. MGH, Mayo Clinic) as others may have different opinions on what's a healthy range for each metric.
- B. Populate hGraph with Synthea's synthetic patient data
 - a. This would allow us to test a variety of data scenarios
 - b. Ability to display a random patient data set or manually choose.
 - c. <https://synthea.mitre.org>, <https://github.com/synthetichealth/syntheticmass>
- C. Demo live on demo.hgraph.org
 - a. Works on Mobile and Desktop Browsers (no native app, no App Store)
 - b. Integrate into new hgraph.org homepage
- D. Update Github documentation as necessary
 - a. Setup and customization (ex. how to select metrics for hGraph, how to customize healthy ranges)
 - i. Goal: So easy a silly designer can have hGraph running on their machine. All steps to setup are listed, no assumptions made.
 - ii. Add Code of Conduct and How to Contribute documentation

Once we establish a demo with FHIR and can test with synthetic data then we move into a production service that can safely handle PHI. A simpler start could be connecting to iOS HealthKit – pulling HealthKit data into hGraph.

Round 2: Production-Worthy

- A. Develop detail view
 - a. 2 modes: simple popup in place that shows value, detail view card with definition and timeline
 - b. Develop beautiful interactions
- B. Using React Native (<https://reactnative.dev> (yay/nay?)), establish a connection to iOS HealthKit for testing sandbox HealthKit data.
- C. Ability to use PHI HealthKit data
- D. Security review and approval by industry expert
- E. Launch hGraph on the App Store

Round 3: Expansion, Subviews...

- Ideas
 - Diagnostics mode for non-engineers
 - Can tweak the healthy ranges, edit health metrics from the browser
 - Share customized hGraph (download?)

Community

- How do we improve our approach with building a community?
 - Open office hours?

- Email newsletter devoted to hGraph?
 - Send hGraph update email via Invo newsletter
- ???
- What are some shining examples for us to follow?
- How can we be radically transparent in what we do?
 - Post the schedule, tasks
 - How do we share the research?

Business

- Patent(s)

Schedule

Milestones to place into calendar

- Supports FHIR STU3
- Repo is easy enough to set up for non-engineers
- Demo is live
- Website is live
- iOS App is live
- ... it's alive! 🐸

- Project: Post schedule on Github
- Research
 - Define agenda for meeting with HCPs to discuss key health metrics
 - Identify 5 HCPs (Advisory board?) for feedback
 - Bon Ku
 - Other colleagues that teach? To maybe get perspective on new areas of focus being taught to tomorrow's MD's.
 - Meghana Karande
 - ???
 - Jane Sarasohn-Kahn
 - Susannah Fox
 - [Define starting set of healthy ranges](#)
- Design
 - Website redesign v01
 - Detail view v01
- Engineering
 - ...

- Research
 - Reach out to 5 HCPs (Advisory board?) to discuss key health metrics
 - Discussions with HCPs
 - Research labs for healthy ranges
- Design
 - Website redesign/build v02
 - Detail view v02
 - hGraph Best Practices Draft
 - Beautiful interactions v01
 - hGraph Best Practices v01
- Research
 - Discussions with HCPs
 - Synthesize learnings from HCP feedback sessions
 - Revise key health metrics list from feedback for a v01 to push into the repo/code
- Design
 - Launch redesigned website
 - TBD: Live demo built-into homepage
 - Beautiful interactions v02
 - Displaying all other health data not integrated into hGraph
- Research
 - Research outstanding healthy ranges for the v01 set of health metrics that will be displayed on hGraph as the default set
- Business
 - Submit ticket for Github trademark violation to claim hGraph organization
 - <https://docs.github.com/en/free-pro-team@latest/github/site-policy/github-trademark-policy>