Commercial Ready Implementation Software

Allows any sensor to connect to any gateway and any clinical health record

Remote Patient Monitoring (RPM) has been embraced by technology enthusiasts for the past decade with an ideal vision to change the way healthcare is provided; from a hospital-centric focus to a more consumer/patient-centric, prevention and an anywhere-care approach through the appropriate use of sensor-enabled technology. However, limited demand has resulted in limited devices and thus limited deployments.

The COVID-19 pandemic has been the global defining event that has thrust remote patient monitoring into the minds of mainstream users. It offers a method for patients to proactively monitor their condition at home with fair warning if/when their condition worsens and warrants admitting to a hospital. In addition, when in the hospital, patients can continue having conditions monitored while isolated from the staff with intervention only seconds away when needed. This early intervention has proven critical to treating and surviving the coronavirus.

Remote patient monitoring has the potential to save countless lives provided more products can reach the market quickly. It will take a collection of companies large and small from all corners of the globe to bring to market the billions of devices that must communicate universally understood health data critical to treating COVID-19 patients.

In a significant leap forward, the Personal Connected Health Alliance has in place today a home to hospital solution that guides manufacturers on how to quickly implement *modern open standards-based solutions* that allows *any* sensor to connect to *any* gateway and *any* clinical health record system on a global scale. This solution is the Continuous Open Development Environment (CODE). It addresses many of the challenges of product development allowing a diverse collection of manufacturers to quickly implement products that will automatically communicate with each other.

To dramatically reduce development costs, CODE includes commercial ready software solutions to implement that guidance. Software is available for collecting observation data via Bluetooth® Low Energy, the upload of observations using FHIR®, and receiving those observations by a FHIR server. It also provides a pathway for proprietary devices to participate in and evolve towards modern open standards. This standards-based software implementation creates **one open API** thus minimizing the cost to maintain compatibility across innumerable platforms.

To help ensure the software has been properly implemented in your products, CODE provides a validation framework that supports continuous integration testing, including tests that employ the use of the physical Bluetooth interface and the cloud interface. A test tool is freely available to demonstrate conformance to industry standards.
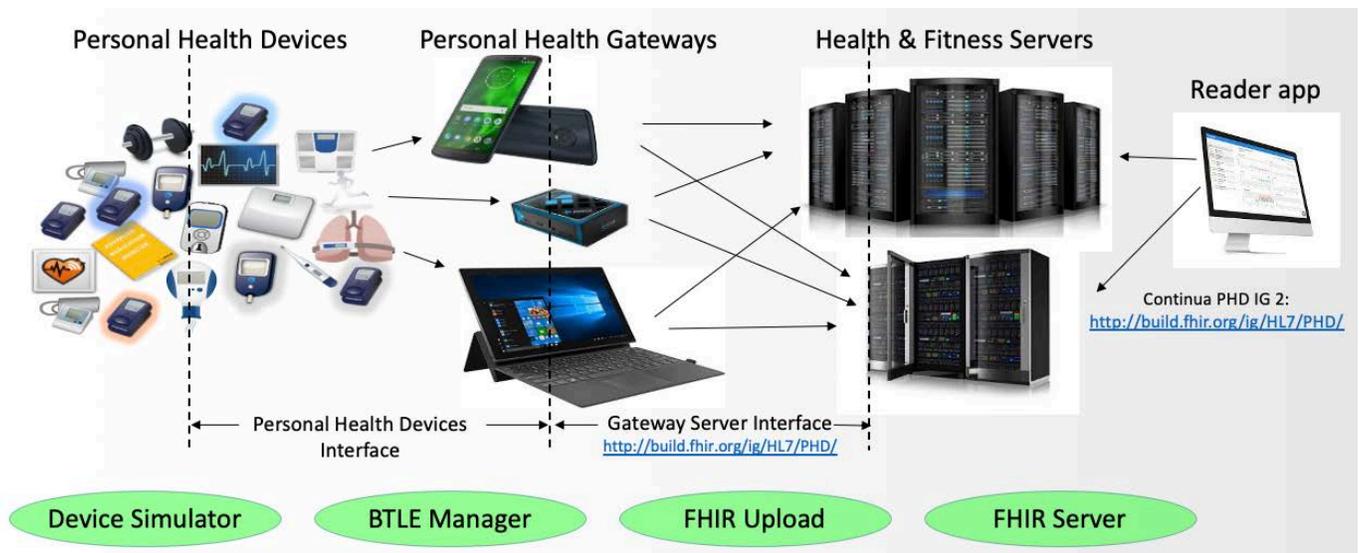
Software for the Device

Feature	Benefit
Drop-in-Code	Greatly reduces engineering expertise required to digest complex standards, allowing healthcare companies to focus resources on differentiating their product in the marketplace.
BTLE Manager	Resolves common Bluetooth interoperability issues. Maintains semantic content of observation data for both standards compliant and proprietary devices.
FHIR Upload	Creates industry standard semantic content by mapping proprietary or standard device data into FHIR resources then uploads those observations to a FHIR server.
FHIR Observation Server	Improves staff workflows by supplying clinical grade data to mobile apps via industry standard FHIR transactions and more efficient Observation Resource only uploads for compute limited devices.
Proprietary Interface	Allows sensor manufacturers to create independent drivers for their devices on gateway platforms that link their products into the standards-based health ecosystem.
One API	Open (Device) APIs give you connectivity, ONE Open API gives you interoperability dramatically reducing integration and ongoing maintenance costs.
ISO 13485 Compliant	Industry standard quality management processes to streamline regulatory acceptance.

Software for the Test Environment

Feature	Benefit
Device Simulators	Ensure gateway supports standards compliant sensors without the need to acquire those sensors or sensors not yet available.
Test Infrastructure	Enables automated testing of devices using the Bluetooth Low Energy and cloud interfaces of the gateway in a continuous integration environment.
IEC 62304 Submission Support	Streamlines regulatory approvals by developing software with an industry standard test infrastructure and development tracking process.

Support for the Developer

Feature	Benefit
Confluence Space	Starting point for accessing software including documentation for build, running and programming of the CODE PHG.
Open Development Environment	Providing the technical and social infrastructures and fundamental software development and release processes to help ensure productive engagement by a community of experts to improve and deploy successful remote patient monitoring products.
Connectathons	Hundreds of industry's top leaders gather face-to-face or virtually to collaborate and test implementations of IHE Profiles and other world-class standards.
Continuous Integration	Allows developers to rapidly evaluate and ensure software modifications produce the intended result throughout the build and test process.
Test Platform	Low cost hardware/software platform that integrates a specialized Bluetooth LE dongle with the simulator software.

Videos with more information

1 Introduction   1:50
2 Confluence Overview   2:55
3 Execution   2:14
4 Setup   1:59
5 Test Framework   5:28

CODE software is currently undergoing beta testing by PCHA members.