IHE Work Item Proposal for Remote Patient Monitoring Profile

# Proposed Work Item: Remote Patient Monitoring Profile

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Domain: <identify the field and/or relevant societies>

# The Problem

In the current IHE infrastructure there is no standardized manner for the health care provider to monitor and provide care to a patient in a remote setting (home, assisted living facility, etc.). This profile uses standards developed and being developed by Continua and HL7 to fill in this gap.

Providing remote care (typically the home) is not only often more comfortable for and desirable by the patient, it is also a means of reducing costs. With an aging demographic in many parts of the world along with skyrocketing health care costs, reducing hospital visits and hospital stays is one way of limiting these costs. In many cases the necessary monitoring is simple, regularly checking weight, blood pressure, glucose levels, etc., and can be easily and cheaply done outside of the care facility. If the results of this monitoring could be reported to the care provider that would eliminate the burden on the patient of making visits and reduce the length of any hospital stays. Remote patient monitoring would be especially beneficial for long time care needs and chronic disease management.

# Key Use Case

There are a couple of key use case examples, post-operative and/or -diagnosis monitoring, assisted living, and chronic disease management, all in the home environment. The first is discussed here.

A patient has just undergone heart surgery. The surgery appears to have gone well and the patient shows no signs of complications. The care giver provides the patient with a Continua-compliant weight scale, blood pressure cuff, pulse oximeter, medication monitor, and installs a Continua complaint application hosting device application on the patient’s mobile phone. The care giver instructs the patient to take a weight measurement, blood pressure measurement, and pulse oximeter reading twice a day along with medication instructions; once in the morning, and once in the evening. Taking additional weight measurements during other times of the day is encouraged. The patient is instructed to first turn on the mobile device, start the installed application, and then use the three provided devices to take the measurements. Medications are dispensed from a special pill box. The patient is given a few practice sessions with the devices, the use of the medication dispenser, and mobile phone application. Everything goes smoothly though it takes some extra effort to get used to taking blood pressure measurements. The patient sees the measurements displayed and medications taken on the mobile device and an indication that the data is dispatched to the care provider. The care provider then accesses the data from the examination room terminal and shows the patient the sent measurements. Once home the patient follows the care giver’s instructions; turn on the mobile device, start the Continua application, and then take the three instructed measurements and the prescribed medications. All devices use the Continua PAN protocol over Bluetooth to transfer the measurements and medication indications to the mobile device. The mobile device then uses the Continua WAN protocol which packages the data in an IHE PCD-01 document to send to a third party backend server used by the care provider. The care provider’s institution uses HL7 CDAs to record and store patient information so the backend server converts the IHE PCD-01 document to a Personal Healthcare Monitoring Report CDA and sends this document to the care provider’s repository using the IHE XDSb transaction. The care provider is then able to examine the document.

# Standards & Systems

Standards involved:

Continua end to end architecture supporting:

the Continua standards for communication between sensor devices and a Continua collector,

the Continua Wide Area Network (WAN) protocol transporting collected sensor data from the Continua collector in IHE PCD-01 documents using the IHE CommunicatePCDData transaction or REST,

the IHE ITI-41 Provide and Register Document set-b transaction to send HL7 Personal Healthcare Monitoring Report CDA documents (under development in HL7) to IHE XDSb repositories.

Systems involved:

* Sensors such as weight scales, pulse oximiters, glucometers, insulin pumps, sleep apneoa therapy devices, cardiovascular exercise equipment, etc.
* Collector application running on mobile or fixed platforms (the sensor devices and collector application host platforms are local)
* Backend server to receive collected sensor data from the collector application
* Health Care Provider facility to retrieve the sensor data either as PHMR or PCD-01 documents.

# Discussion

IHE provides standardized methods for the creation and documentation, exchange, access, and display of patient data within and between health care organizations. The coverage is extensive and quite complete. Adding remote monitoring capabilities extends the care options to take place outside established health care facilities.

It is envisioned that what is proposed here is only an initial stage. Protocols are under development for a reverse flow of traffic, where the care provider can control the medical systems in the remote environment and query the patient’s status. Further in the future this profile or other profiles assisting in remote care may involve interactive sessions with the care provider using such standards as DLNA.