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 and often by the patient. 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, chronic disease management, assisted living, and post-operative and/or -diagnosis monitoring, all in the home environment. The post-operative monitoring case 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 either uses the Continua HRN interface and sends this data as a PHMR document to the care provider’s repository using the IHE XDSb transaction. Given that the XDSb transaction is resource demanding, many mobile devices will, instead, use the Continua WAN interface to send an IHE PCD-01 document to a WAN server back end which is then configured to convert the PCD-01 document to a PHMR and use the Continua HRN interface to send the document to the care provider’s repository.

# Standards & Systems

Standards involved:

Continua end to end architecture supporting:

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

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,

the IHE PCD-01 CommunicatePCDData transaction or hData exchanges to send PCD-01 documents to an intermediary back end.

Systems involved:

* Sensors such as weight scales, pulse oximeters, 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)
* Health Care Provider facility to retrieve the sensor data either as PHMR or PCD-01 documents.

Though standardized transactions between the sensor devices and the Continua collector are promoted, they are not necessary as long as the sensor devices provide sufficient information such that the information can be mapped to that which would have come from a Continua compliant sensor.

# 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. This profile describes the process via which patient data obtained from personal health devices is transported to an EHR supporting HL7 Version 3 XDSb transactions.

The above profile (or series of transactions) has actually been implemented and used at several HIMSS showcases. It has also been partly tested at the HIMSS 2013 connectathon where the ‘partly’ arises since there is no official recognition of such a profile. Interoperability is obtained by replacing the PHMR document code with the code of the History and Physical or having the XDSb repository software add the PHMR document code to its list of accepted documents.

It is envisioned that what is proposed here is only an initial stage. Continua also has existing standards for patient consent, consent enforcement, questionnaires, and authenticated persistent sessions which set up a framework for a reverse flow of traffic (care provider to patient). These exchanges are also an important part of remote patient monitoring and would be added to the existing profile.