Integrating the Healthcare Enterprise White Paper

Urgent Implantable Rhythm Control Device Identification (PDQ-IRCD) Profile

This white paper provides information regarding the *Urgent Implantable Rhythm Control Device Identification Profile (PDQ-IRCD)* of IHE Cardiology. Although this Profile is nearing completion of its technical specification, it is beyond the scope of Year 2 (2006) IHE demonstrations.

In addition to the Profile described in this document, there are other IHE Cardiology Profiles specifically applicable to Electrophysiology: Implantable Cardiac Device Interrogation (ICDI) Profile and Profiles for the EP Lab.   These are described in separate white papers.

Problem Statement: Patients with implantable rhythm control devices (IRCDs, i.e., pacemakers and implantable cardioverter defibrillators) often present in emergency situations to physicians with no knowledge of the patient or of the specific implanted device (e.g., pacemaker vs. ICD, specific manufacturer, model number, etc.). Frequently, the patient does not know the specifics of the device, or may not be in a physical state to convey information to the physician. This poses a practical problem for the clinician, particularly in cases where the nature of the emergency presentation requires immediate reprogramming of the IRCD (e.g., disabling of an ICD that is delivering inappropriate shocks); only the appropriate programmer from the appropriate manufacturer can communicate with the IRCD. At present, the clinician has three ways to identify the IRCD:

- taking an X-ray of the device, locating the embedded identification tag, and finding a source to associate the ID tag with the specific device
- contacting each IRCD manufacturer's technical support services, until one is found with a record of the patient in its patient registry
- attempting to interrogate the IRCD with each of the available programmers until one is found that will successfully communicate with the implantable device

Each of these alternatives is time-consuming, and a faster, simpler way to identify the IRCD in an emergency situation is highly desirable.

Use Case: The primary clinical use case revolves around a patient with an IRCD presenting to a hospital's emergency department. Often, the patient will have a manufacturer-issued identification card that will identify the device, allowing the clinician to determine the appropriate programmer to use to modify the IRCD's functional parameters. However, the patient may not have the identification card on his/her person, and may not know or be in a condition to communicate the information necessary to identify the device. If there is a need to immediately program the device, a delay in identifying the device and the necessary programmer can be detrimental to the patient's care.

This integration profile documents how patient registry data from different sources (multiple manufacturers, national or governmental databases, etc.) can be made accessible electronically to the emergency department clinician from a single source. By entering as much identifying data on the patient as is available to the physician (e.g., patient name, Social Security or other identification number, age, implanting hospital or physician, implant date, etc.), the clinician would be able to initiate a single query that would search all available registries for patients who match the input information, and report back to the clinician the device identification information necessary to select the appropriate programmer for the registered patient or patients that most closely match.

This query and response must be handled with the utmost care for the confidentiality and security of patient data.

PDQ-IRCD Profile Benefits: This IHE profile provides benefits to clinicians and administrative staff focusing on **improving patient care** and **reducing inefficiencies**, specifically by:

- Providing a means for clinicians, in emergency situations, to identify a patient's IRCD (and the associated programmer) quickly and from a single source
- Eliminating the need for trial and error with various programmers, multiple phone calls to the various manufacturers, etc. to identify the IRCD

- Allowing registry data from multiple registries to be queried via a single interaction with a single interface

How the PDQ-IRCD Profile actually works: IHE defines "Actors" that are responsible for performing certain roles. Examples of actors in the Urgent Identification profile include the Query/Display System, and the Registry Databases. "Transactions" between actors are defined by the profile, allowing multiple actors to be integrated in a standardized fashion.

In an example of a real-world application of this profile, a governing entity (e.g., the ACC, HRS, a country's health ministry, or some other trusted body) would manage the central access point to IRCD data in a nation or region, providing a standard query destination and secure access. The Query/Display systems would be emergency department information systems, or perhaps a Web-based portal for those sites that do not have an emergency department information system with the requisite "IHE Actor" capabilities. The individual manufacturers, or government registries, would maintain the databases and provide the appropriate data through the central access point to the query/display systems.

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┌──────────────┐                            ┌──────────────┐
│ Emergency    │                            │ Clinical     │
│ Department   │                            │ Workstation  │
│ Information  │                            └──────────────┘
│ System       │                                   │
└──────────────┘                            Secure HTTP
        │                                   Channel Over
   Secure HL7                                 Internet
   Channel Over
     Internet   ┌─────────────────────────────────────────┐
               │  ┌──────────┐   ┌──────────┐              │
               │  │ Central  │   │ Web      │              │
               │  │ Access   │───│ Access   │              │
               │  │ Server   │   │ Server   │  Trusted Party
               │  └──────────┘   └──────────┘  Clearinghouse
               └─────────────────────────────────────────┘
       ┌──────────────┐                    ┌──────────────┐
       │ Manufacturer 1│                   │ Health Ministry│
       │ Database      │                   │ Device Registry│
       └──────────────┘                    │ (e.g., other   │
                                           │ country)       │
       ┌──────────────┐  ┌──────────────┐  └──────────────┘
       │ Manufacturer 2│  │ Manufacturer 3│
       │ Database      │  │ Database      │
       └──────────────┘  └──────────────┘
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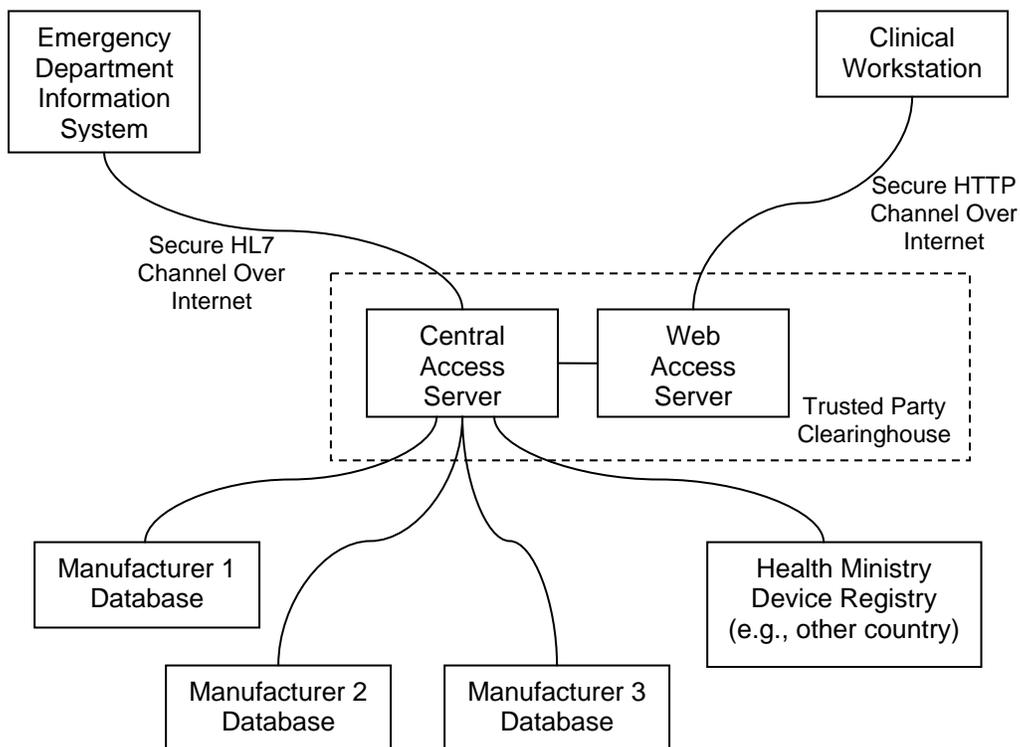
"PDQ" in the official abbreviation "PDQ-IRCD" stands for the IHE "Patient Demographics Query" Profile. IRCD is a simple specialization of the generic IHE PDQ Profile. PDQ is designed to obtain a list of patients meeting some demographic query parameters. PDQ-IRCD also leverages other IHE Profiles for

secure communication and access control.   For more technical details regarding the IHE transactions, please refer to the IHE Cardiology Technical Framework and Supplements documents.

Importance of the IHE Process: IHE provides a collaborative forum in which the clinical professionals of the Heart Rhythm Society meet with *all* IRCD manufacturers, as well as vendors of clinical information systems, to agree on a standards-based approach to solving a critical patient safety and efficient care delivery problem. Moreover, IHE provides a program for monitored inter-vendor testing, the "Connectathons", through which implementations adhering to the Profile can be validated, thus speeding the deployment of the Profile's capabilities to market.

Purchasing Using IHE: One of the key concepts of IHE is the ability to definitively describe interfaces with a single sentence.   Using the statements below mitigates the need for hundreds of pages of technical documentation, interface engines, and on-site testing. For example, the following statements should be included in any request for proposal (RFP):

"The **Emergency Department Information System** shall support the IHE Urgent Implantable Rhythm Control Device Identification Profile as the Query/Display System Actor."

"The **Electronic Healthcare Record (EHR) System** shall support the IHE Urgent Implantable Rhythm Control Device Identification Profile as the Query/Display System Actor."

In addition to the IRCD Profile, other IHE Profiles should also be considered for a RFP. These include Implantable Cardiac Device Interrogation (ICDI), Profiles for the EP Lab, Cardiac Catheterization Workflow, Echocardiography Workflow, Retrieve ECG for Display (ECG), Displayable Reports (DRPT), Cross-Enterprise Document Sharing (XDS), and Portable Data for Imaging (PDI) Profiles.

Summary: IHE Integration Profiles improve patient care and access to information in the clinical environment. It is worth your time to learn more about IHE.   See www.ihe.net or www.acc.org/ihe.htm .

Consider joining the "IHE Cardiology Users' Group" which holds web seminars, teleconferences, and other educational opportunities on an informal basis.   For more information, send an email to ihe@acc.org.