



IHE 2012-2013 Call for Proposals

IHE Brief Work Item Proposal

1. Proposed Profile: IVI Workflow

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2. Introduction

Intravascular imaging (IVI) techniques, such as intravascular ultrasound (IVUS) and optical coherence tomography (OCT), have recently played a pivotal role in the practical guidance for percutaneous coronary intervention (PCI). These techniques provide significant insights into pathological processes of the vasculature, such as the extent of calcification, plaque burden, vascular remodeling, neointimal proliferation, and stent endothelialization in patients with coronary artery disease, while coronary angiography imaging (CAG) is limited to a planar silhouette of the contrast-filled lumen. In fact, a number of studies have demonstrated that IVUS-guided PCI could improve the outcomes of stenting by identifying several morphological or morphometric risk factors, such as stent underexpansion and residual reference disease.

In this context, a novel workflow using intravascular imaging (IVI) technique during catheterization is required as a new option in cardiac catheterization workflow integrated profile (CATH).

3. The Clinical Problem

Typically, the decision to use IVI is made during a catheterization study. Therefore, IVI is not always scheduled in advance and ordered only when necessary after catheterization starts.

Despite this, full clinical details must still be captured and fully integrated in the patient's clinical record.

4. The Technical Problem

1. Patient Registration

In Japan, especially we have an insurance system that applies to a nation's entire population. All patients can get medical treatment, to facilitate accounting process flow, in case of emergency, unknown patient (John.Doe) with a temporary patient ID and patient's name is often registered on the ADT system.

Comment [NS1]: For instance, a small slip that has PatientName and PatientID is used in hospital.

2. Scheduled Procedure

IVI study is ordered only when necessary during catheterization. Therefore, the workflow including IVI has to support ad-hoc orders in both emergency and routine examination scenarios.

An order is often placed for an emergency study, even then the IVI study is rarely scheduled. And even for studies of registered patients or studies scheduled in advance, IVI is rarely scheduled electronically.

3. Query Modality Worklist (MWL)

IVI Modalities are mobile. When the environment does not provide network access, Patient ID must be entered manually before study.

4. MPPS Modality Performed Procedure Step

- Modality Procedure Step In Progress [CARD-1]
- Modality Procedure Step Completed [RAD-7]

As with other catheter studies, several modalities are used during an IVI study (Polygraph, Hemo, Xray, IVI, etc). But in an IVI study, the IVI modality is often subordinate to other modalities, such as the X-ray and typically does not take responsibility for starting and ending the study.

Then no IVI modalities implement below transactions.

- Modality Procedure Step In Progress [CARD-1]
- Modality Procedure Step Completed [RAD-7]

The information of implement non-scheduled procedure to DSS/OF is needed.

5. IVI study data

The images taken in an IVI study have a large number of frames. The IM/IA needs a large capacity to save the images. Some IVI modalities produce a number of DICOM datasets with different modality tags, such as voice data or analysis data with Tissue Characterization of Coronary Plaque , etc.

5. Key Use Cases

Use Case 1: Intravascular Ultrasound/Optical Coherence Tomography Diagnosis

An emergency patient is taken to a hospital, and an emergency catheterization study is required. The patient is registered as a John Doe with a temporary Patient ID in the ADT system and then an order is placed in the Order Placer. The order is communicated to the DSS/OF which schedules the

procedure. The Angiography modality receives study information using MWL, and starts the Acquisition. At the same time, the Polygraph starts to monitor, and using the CATH profile mechanism, queries the worklist to synchronize on the patient.

Based on diagnosis with Angio, it is decided the diagnostic IVUS is needed.

There is no network access for the IVUS device in the Cath room. So the Patient ID entered to IVUS manually, and IVI study is performed.

Study images of Angio, Polygraph, IVI are sent to the IM/IA and are archived.

Study is finished. The DSS/OF notifies the OP about the study after receiving study completed message from the Angio system.

Study information is modified on the DSS/OF after study (add IVI study), and DSS/OF sends the updated information to the OP.

As in cases from C1 to C6, By Patient Information Reconciliation (PIR), Patient Information is updated.

6. Standards Currently Available

IHE Cath Workflow Profile

DICOM IVUS Image Object

HL7v3 IDC Observation message

7. Systems

Modality: IVUS, OCT, IVOCT, US

DICOM Order Filler (MWM)

DICOM Image Manager/Image Display

8. Discussion

It is proposed to add IVI modalities as portable device to the CATH Profile. For example, perhaps:

- add a new modality, IVOCT (Intra Vascular Optical Coherence Tomography)
- add a use case section to CARD TF-1:3.4 discussing IVI, for example, “Change Modalities” should be add
- additional discussions/text as needed for remaining issues