IHC McKay-Dee Hospital
Partial Implementation of Scheduled Workflow

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Project
McKay-Dee Hospital in Ogden, Utah has been in operation since March 25th, 2002 with a fully digital Radiology Department, excluding Mammography. McKay-Dee is part of the Intermountain Healthcare Care (IHC), which has 22 hospitals and 100 clinics, with a combined 2068 beds, in the Utah area and Southern Idaho. For radiology, 93,100 examinations have been performed in 2001 and a total of 97,200 is projected for 2002 (approx. +5%). The quick success from planning, beginning the early part of 2000, to completion of a “filmless” environment was only possible via the selection of systems from vendors who are not only committed to international standards (DICOM 1, HL7 2), but who are also committed to the harmonization and integration between different vendor systems. (IHE 3)). The hospital is operating within a mixed environment from several vendors, i.e., SIEMENS Medical Solutions for most of the modalities, AGFA and AMICAS for PACS and web distribution, and MITRA for connection to RIS. Therefore, the key in system selection was “IH”, or in other words, integration. Standards alone are not sufficient. “The workflow”—the thing between—is the solution, and the IHE profiles with their actors are excellent guidelines.

IHE-DICOM Architecture
The Fluoroscopy systems and FDs systems get the worklist via DICOM Basic Worklist and sending the images via DICOM Image Store to the AGFA PACS within the IHE Scheduled Workflow, which is partly fulfilled, because DICOM Modality Performed Procedure Step is missing in the RIS/HIS-system. All SIEMENS-systems are receiving the DICOM worklist from the hospital “homegrown” RIS/HIS called Health Evaluation through Logical Processing, original from 3M. The RIS/HIS is HL7-based with ADT Order Filler and Placer and the transformation to DICOM Basic worklist is done via MITRA-Broker. All images are sent via DICOM Send to the AGFA-Impax PACS. At the AGFA PACS all received images are validated and distributed to the Web-Servers from AGFA and to the AMICAS Web-Server (redundant server with 2 TB RAID). Studies are available on demand, at any one of the 19 AGFA workstations (9 review level, 10 diagnostic) throughout the facility.

Conclusions/Discussion
The benefit of the fast integration is outstanding procedures are performed with the DICOM worklist without having to wait for paperwork and manual data entry of patient demographics. Examinations are performed, checked for quality, and sent to PACS much faster than pre-integration. The high data integrity between the RIS, the modalities and the PACS helps to have consistent data.

The basic requirements within the planning phase for the connectivity for the modalities were DICOM Send, Print and Worklist management. We are aware that more DICOM functionalities, which are incorporated in the IHE profiles, will make sense, and we intend to do a “step-by-step” approach to realize more integration. For IHC, this was the first large-scale digital radiology project in which all modalities, PACS, and RIS would integrate for a single “go-live” date, film-based to filmless, overnight.

Since opening the new McKay-Dee facility on March 25, 2002, we have experienced record exam volumes in Radiology. These increased volumes did not require any additional staffing since we have had significant efficiency gains with the new workflow processes, quicker exam times, and minimal film handling. We have experienced other improvements with the transition to a digital environment. With DICOM worklist query we have dramatically reduced the number of mistakes relating to patient and study demographic errors.

In the new McKay-Dee facility, radiology has become a “decentralized” department. The successful integration of systems has also allowed us to have technologists performing exams away from the main Radiology department, and yet, have an immediate interpretation from a Radiologist by sending images to PACS with DICOM store.

The McKay-Dee Radiology transition has been a tremendous and almost unbelievable project. All vendors involved in worked together to insure connectivity and proper image and patient/study demographics from RIS to modality to PACS. We are farther along than we had anticipated with respect to efficiency and we are anticipating future improvements in our process by working with vendors to add more DICOM functionality.