

Imaging: New Electronic Tool For Clinicians

Susan I. Reynolds RN BSN M.Ed.

Computer Information Specialist, James E. Van Zandt VA Medical Center Altoona, Pa

Purpose:

The Veterans Health Administration (VHA) Imaging System was designed to acquire clinical medical images and deliver these images immediately to multiple health care providers for the purpose of expediting the process of clinical diagnosis and treatment.

VHA Imaging also created a very important tool for patient identification by incorporating a method of 'capturing' a digital photograph of the patient and displaying this image on that patient's electronic chart. This method of identification adds another dimension to patient safety by addressing the historic problem of documenting critical data on a misidentified patient medical record.

VHA Imaging facilitates multidisciplinary remote consultations (such as 'Grand Rounds') with review of radiology images, pathology slides, endoscopic images, etc. Sequential visual comparative studies of medical conditions can be reviewed to assess treatment effectiveness such as antibiotic effectiveness for infectious process with 'before', 'during', and 'after' photos. Scanned documents assuring the most current patient documents such as 'Advance Directives' are available for honoring the patient's health care desires.

Method:

VHA Imaging systems are designed to acquire, store, and display medical images linked (indexed) to individual patients in an Electronic Medical Record (EMR).

There are two (2) methods of image acquisition (capture), DICOM (Diagnostic Image Communication Of Medicine) and non-DICOM. DICOM is a transmission standard.

The DICOM images are acquired directly from DICOM devices such as Ultrasound machines and PACS (Picture Archiving Computerized System) systems in Radiology. The medical service performing the study selects the appropriate patient request from the list of electronic orders presented to the technician from Modality Worklist (MWL) software. The study is completed and then sent to the imaging storage servers and indexed to the patient's electronic request. The image and text data is then viewable through a Display Client when selected from the patient EMR.

Non-DICOM images, such as scanned documents, digital photos, etc., are captured on a 'Capture Station' that has a Capture Client installed. The Capture Client software acquires the images and indexes the image to the patient at the 'point of capture'. The study is completed and then sent to the imaging storage servers and indexed to the patient's electronic request. The image and text data is then viewable through a Display Client when selected from the patient EMR.

The main components include a 'short term' storage server, a 'long term' storage server, a Display Client to display the

images on the workstation, a direct DICOM processor, a Capture Client for capturing Non-DICOM images, and a Text Gateway to link the textual interpretations to the acquired image.

Results:

It has been found that image availability in the EMR has increased the interest in a computerized EMR and this interest has improved patient care through collaborative communication among health care providers.

Communication has notably improved between Operating Room staff and the Pathology Lab, as images are available for sharing simultaneously.

Education of nursing students has notably improved due to the availability of images from VHA Imaging for educational purposes.

While written descriptions of lesions and infectious processes may be detailed, the visual presentation of these conditions is much more accurate and effective for diagnosis and treatment.

Effectiveness of treatments can be more accurately assessed, by acquiring 'sequential' images of conditions during the treatment period. An example would include the acquisition of a digital photo of a dermatological condition before, during, and after treatment.

Conclusion:

VHA Imaging enhances the collaboration of health care professionals in the patient care environment by providing immediate access to multiple disciplines simultaneously.

These medical images can expedite diagnosis and treatment which enhance patient care by decreasing inpatient 'bed days of care', while decreasing outpatient visit delays in the retrieval of critical studies such as x-rays and EKG's. Images acquired to a patient's EMR are strictly controlled to assure excellent image quality. The VHA Imaging system is considered a medical device and all image types must be reviewed and certified by FDA standards for image resolution and image depth.

Implications:

The captured images (X-rays, EKG's, Advanced Directives, etc) are extremely helpful in follow-up care. Lesions that are being followed over time can be compared directly. The effects of treatment can be examined objectively. EKG's and Advanced Directives are especially helpful in the emergency room. Old EKG's are always available to access current changes. Imaging has been found to be cost effective in material, storage of information, staff resources, and time.

Cover Letter Information:

Susan I. Reynolds RN BSN M.Ed.
Computer Information Specialist
James E. Van Zandt VA Medical Center
Altoona, Pa 16602