TO: Under Secretary for Health (10)

THROUGH: National Leadership Board

FROM: Chief Health Informatics Officer

SUBJECT: Storing PACS Images in VistA Imaging

For further information Contact:

Action Requested:  x Request for approval
                  _____ Request for discussion for further review
                  _____ For your information
                  _____ Other (Specify)

STATEMENT OF ISSUE: VHA has deemed creating a Patient Centered Electronic Healthcare Record to be a key goal for the organization. Efforts such as the Health Data Repository, Data Standardization and the migration to HealthEvet VistA all seek to ensure that all of a patient's clinical data is available to all healthcare practitioners, regardless of the location of the patient, care giver or patient data. As well, efforts such as Document Imaging, VistA Imaging, Clinical Procedures, the Barcode Expansion Project and the ICU flowsheet effort all attempt to make available electronically information that previously could be accessed only through paper medical records.

Adding to this suite of applications, in September 2005, the Office of Information will release an enhanced version of the VistA Imaging Display Client that supports Remote Image Views (VIDC-RIV). Through this tool, VIDC-RIV users will be able to access all images stored in any VistA Imaging system through the user's standard logon to their home VistA system. Previously, to view images stored at remote sites, a user would have to have an account on each remote VistA system they wished to query. VIDC-RIV will provide a single, composite list of all of a patient's images, including radiology studies, procedure reports captured through Clinical Procedures software, scanned documents (e.g. outside medical records, Advance Directives, nursing flowsheets, etc), Electronic Informed Consent documents, medical photography (e.g. dental or retinal imaging), drawings and annotated images, endoscopy images, cardiac catheterization cineangiograms, pathology microscopic images, etc. VIDC-RIV will also provide access to the remote report, note or consult associated with remote images.

In 2001, through Directive 2001-045, VHA clinical leadership mandated installation of VistA Imaging Core Infrastructure at all facilities (including image storage devices and the VistA Imaging Display Client (VIDC) software). This was done "to ensure that all sites store patient information that can be captured at the point of encounter so it will be available electronically online and retrievable across the VA". The VHA mandate required all medical facilities to complete installation of core infrastructure by September 30, 2004 and to scan certain clinical documents and make them available online as part of the electronic medical record. This goal was met in May 2004.
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VHA sites vary in their approach to radiology image storage. At sites where VistARad is the tool for presenting images to radiologists (currently 61 sites), all radiology images are available in VistA Imaging. The VIDC-RIV allows these images to be viewed by clinical staff across VA. Sites that use commercial Picture Archiving and Communication Systems (PACS) in some cases store images in both VistA Imaging as well as the PACS (potentially 50 sites by end of fy06). Others desire to keep images only in the PACS (potentially 33 sites by end of fy06). PACS images stored in VistA Imaging are available VA wide to VIDC-RIV users. Images kept only in PACS do not contribute to the integrated composite image list offered by the VIDC-RIV. At such sites, users browse PACS images through a separate, vendor specific image viewer. Remote staff, both in the same VISN and in some cases national, can use this same viewer to see these images, assuming they have access to the viewer, authorization on the remote PACS and are aware that images of interest may reside therein. A few sites do not yet store radiology images in digital form. These sites all plan to implement filmless radiology systems in the near future.

RECOMMENDATION (of the requestor): Establish VHA policy requiring all VHA facilities to store all digital radiology images in VistA Imaging in a time-forward manner, thus making these images available to staff at all VA sites through a single common interface. Sites that do not currently store PACS images in VistA Imaging shall be required to do so. These sites will need to augment their VistA Imaging hardware storage capacity if their current capacity is not adequate. The overall cost to VHA for augmenting VistA Imaging hardware is estimated to be at most $1.5M. Within six months of the date of signing of this memo, sites shall commence this copying of all newly captured radiology images.

IDENTIFY THE VHA GOAL, OBJECTIVE AND STRATEGY BEING ADVANCED BY THE REQUESTED NLB ACTION:

- Continuously improve the quality and safety of health care for veterans, particularly in those health issues associated with military service.

- Provide timely and appropriate access to health care by implementing best practices.

- Promote excellence in business practices through administrative, financial, and clinical efficiencies.

- Promote excellence in the education of future health care professionals and enhance VHA partnership with affiliates
I. **STATEMENT OF ISSUE:**

<repeat statement of issue from page 1>

II. **SUMMARY OF FACTS AND/OR BACKGROUND:**

Radiology images are a vital part of the medical record. Clinical staff value having ready access not only to the interpretations of radiologists but also to the images upon which those interpretations were based. VHA currently performs 6 million radiology studies per year. In addition, 6% of all VHA patients are seen in more than one VISN in a three year period, and up to 25% may be seen at more than one facility within a VISN in this same time frame. Having access to a patient's complete medical record is a key goal for VHA, and this record includes radiology images.

Commercial PACS are becoming increasingly common in VHA. However, with the multiplicity of systems from different vendors in use, it becomes increasingly complex to present to VA users a consolidated list of all of the radiology images a patient may have across these varied systems. These systems similarly may not share common approaches or tools to image viewing or access controls integrated with the VA authorization procedures. The systems may also not be fully integrated with VA's electronic healthcare record, and as such may have limited ability to display the radiology report associated with an image, or vice versa. Having a single, common repository for image information alleviates these issues. In VHA today, that repository is VistA Imaging.

Some sites that have commercial PACS are hesitant to store radiology images in VistA Imaging in addition to their PACS. Their PACS has been a substantial investment for them, an investment justified by a belief that the PACS offers capabilities not available through VistA Imaging. These sites view storing images in VistA Imaging to be an unnecessary expense since they already make the images available to their users through vendor specific tools. In addition to increased storage requirements for their VistA Imaging infrastructure, they also are concerned that increased staff time would be required to manage the extra images that would be housed in VistA Imaging and to keep the images synchronized between two systems. They believe that PACS images placed in VistA Imaging would be viewed only by staff outside their VISN, and as such this local investment would not serving the needs of their facility or VISN.

Other sites that have commercial PACS do store radiology images in VistA Imaging as well as the PACS. These sites view VistA Imaging as their official system of records for these images, knowing that VA will preserve VistA Imaging images for the full time period required by record retention rules. These sites often purchase less storage for their PACS and delete older images from PACS knowing they can be retrieved from VistA Imaging if needed. Also, keeping images in VistA Imaging provides insurance against PACS vendor business failure or a vendor's decision to no longer support a PACS. As such, they may avoid the need to migrate images en masse from one system to another, a task that is often difficult, expensive and time consuming.

In several ways, the need to copy PACS images into VistA Imaging may be viewed as an interim measure. The plans for the migration to HealthVet VistA include reengineering of VistA Imaging. As part of this reengineering VistA Imaging will create a nationally managed long term repository for all clinical and administrative images. It
would be expected that sites with commercial imaging systems such as PACS would copy these images into the long term repository for permanent storage. A reengineered VIDC-RIV would be able to pull all non-local images from this long term repository instead of needing to interact with multiple remote VistA Imaging systems when building composite image lists or displaying individual images. At such times, sites would no longer be required to copy PACS images into local VistA Imaging systems in order to allow these images to be access by remote users – remote users would access the long term archive instead. Once the long term repository is in place, PACS images could be copied to the single VHA managed national image store instead of their locally managed VistA Imaging system. Establishing VISN-level VistA Imaging image repositories for remote viewing of PACS images is also a possible future solution, one that could potentially be implemented before the national archive is in place. Also to be considered is storing only the non-diagnostic quality images in VistA Imaging in order to minimize extra storage requirements.

VistA Imaging continues to enhance its interface with commercial PACS. Future work in this area could provide an additional method for avoiding having to copy PACS images into VistA Imaging in order to support remote access. If VistA Imaging could query a PACS on demand for a patient’s image lists and selected images, then the VIDC-RIV could receive all required PACS information through queries to VistA Imaging. Once such an enhanced VistA Imaging to PACS interface is in place, PACS sites would again cease having the need to copy PACS images to VistA Imaging in order to support remote image viewing and consolidated image list generation.

In summary, remote access to radiology images is in keeping with VHA’s commitment to providing all VA staff with simplified access to the complete, consolidated medical record of a patient independent of patient, staff and/or data location. Copying PACS images to VistA Imaging facilitates achieving this goal today and affords sites several benefits. Future plans for reengineering VistA Imaging, including regional and national long term archives as well as enhanced PACS interfaces may remove the need for copying PACS images to local VistA Imaging systems.

III. SYNOPSIS OF SIGNIFICANT RELATED ISSUES: N/A

IV. CRITERIA FOR DECISION MAKING:

Does the recommended option meet the need? Yes. Through this option, all radiology images would be available to all VA staff through a common tool, a single logon and linkage with CPRS, Capri and VistA report data.

Is the recommended option acceptable to potential users? Yes. This request has been endorsed by the Health Systems Committee in recognition of the importance of making radiology images available all VA staff through a single interface that is well integrated with other VistA applications.

Is the recommended option cost-effective? Yes. Other options for achieving this same result require significant software development, integration with vendor-specific tools and maintenance of multiple vendor image browsers on all VA systems. The cost of these alternatives would be substantially higher than that of the recommended option.
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V. CROSSCUTTING ISSUES: N/A

VI. STAKEHOLDER INVOLVEMENT: This request has been reviewed by the Health Systems Committee, the Health Information Systems Executive Board for Provider Systems, the VistA Imaging Change Control Board and the Radiology Field Advisory Board.

VII. OPTIONS AND ARGUMENTS:

Option 1: Status Quo. PACS images browsed using vendor-specific tools

Arguments Pro:
- No new funding required

Arguments Con:
- Multiple vendor systems in use throughout VHA. Requires all sites to install all vendor specific solutions and maintain connections to these vendor-specific systems, even though a site may not use those vendor-specific systems locally
- Does not offer a single integrated image interface
- May not allow user to navigate between image and associated report (or vice versa)
- Users need to learn when and how to access and use multiple vendor-specific image browsing tools and my need accounts on multiple vendor systems

Option 2: Require PACS images to be stored in VistA Imaging in a time-forward manner

Arguments Pro:
- No software development required. PACS sites already have the required technical tools for storing images in VistA Imaging as well as PACS
- Interim solution until new VistA Imaging national image storage architecture and/or PACS interface is designed and deployed (several years away)
- Minimizes hardware augmentation expense if expanded storage is needed for only a few years
- Additional storage requirements can be minimized if only non-diagnostic quality images are copied to VistA Imaging (8:1 compression).

Arguments Con:
- Cost estimated at $1.5M combined for increased VistA Imaging storage space at sites that do not currently copy PACS images to VistA Imaging
- Some additional staff time may be required as well
- Adds complexity as staff need to ensure synchrony between images in VistA Imaging and PACS
- Makes current, but not older, radiology images available to all VA staff
- Sites that store non-diagnostic quality images in VistA Imaging need to manage their PACS as a system of records, including attending to records retention requirements

Option 3: Require all past and future PACS images to be stored in VistA Imaging

Arguments Pro:
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- Fully consistent with VHA goals for access to consolidated medical record
- Meets VHA records retention requirements
- Provides protection against vendor business failure

Arguments Con:
- Significantly increased cost vs. option 2
- Substantial time an effort required to copy existing PACS images to VistA Imaging

Option 4: Wait for future capabilities of VistA Imaging (regional/national image store, enhanced PACS interface)

Arguments Pro:
- Potential ultimate, long term solution

Argument Con:
- Would delay remote PACS image availability for several years
- Requires software development

VIII. RECOMMENDED OPTION: Option 2

IX. DISSENTING OPINIONS REGARDING RECOMMENDED OPTION: Dissenting and/or alternative points of view are discussed in sections II and VII.

X. EFFECT OF RECOMMENDED OPTION ON EXISTING PROGRAMS AND/OR FACILITIES: None

XI. LEGAL OR LEGISLATIVE CONSIDERATIONS OF THE RECOMMENDED OPTION: None

XII. BUDGET OR FINANCIAL CONSIDERATIONS OF THE RECOMMENDED OPTION: Facilities that do not currently copy PACS images into VistA Imaging will be required to do so. They may need to purchase additional storage capacity and dedicate some staff resources in order to meet this requirement. Most facilities already have adequate storage capacity, especially if only non-diagnostic quality images are copied to VistA Imaging. Cost per facility is at most a $50 thousand, a one time expense to purchase 10 terabytes of storage space.

XIII. PUBLIC RELATIONS OR MEDIA CONSIDERATIONS OF THE RECOMMENDED OPTION: None

XIV. CONGRESSIONAL OR OTHER PUBLIC OFFICIAL OR AGENCY CONSIDERATIONS OF THE RECOMMENDED OPTION: None
XV. **IMPLEMENTATION:** Facilities and/or VISN technical staff shall be responsible for achieving the goals of this directive through interfacing their PACS and/or Imaging Modalities with VistA Imaging and through augmenting their storage capacity as required. VistA Imaging customer service staff are available to assist sites in these steps as well as in designing VISN-wide solutions that achieve the requirements of the recommended option.

**APPROVE/DISAPPROVE**

**COMMENT:** **Strongly Support Framework to make images available nationally.**

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Under Secretary for Health (10)

12-15-05  
Date