Quality Improvement Project Report

Description of Submitter Involvement in Project:

I am the PACS administrator at the primary healthcare facility for Anywhere USA Health (AUH). As the PACS Administrator I served as the lead imaging representative for the team that implemented a consolidated PACS system across all of our facilities.

Description of Problems

AUH is our regional transfer center, so we are getting patients from all of our 10 sister facilities on 24x7 basis. This is for the continuum of care that our sister facility may not have available locally. Physicians want to review images from our sister facilities – sometime well before transfer decision could be made. It took phone calls and some efforts to get those images to our PACS. This was causing issues.

We also have a very busy ER, so report turnaround time (TAT) was always challenging due to radiologists at various sites on different PACS.

Another problem was to access specialty reading Radiologist on 24 x7 basis.

So we were experiencing many challenges due to having 4 different PACS from 2 different vendors.

All of these prompted us to come to a solution to increased efficiency and to improve quality of our patient care in a cost effective manner. With our senior leadership engagement, we came to a conclusion that the solution is to have a one Consolidated PACS that supports all of our sister facilities across the US (AUS).

Discussion of Pre-intervention Measurements:

It was determined that all of the individual VENDOR1 PACS would be first consolidated into a single VENDOR1 PACS. After that our other vendor PACS (VENDOR2) facilities would be converted and join that Core system. Based on proposals, quotes were reviewed, revised and re-reviewed and finally the contract was signed.

Operational, Workflow and Technical factors were discussed through series of meetings and calls.

Operational Factors:

- Where do the clinicians view radiology reports from? Any Tumor Board Processes?
- Where do the radiologists view existing/prior reports from?
- What are current CD Import and Burning Processes?

- Division of labor- what are reading Radiologists strategies (specialty based v/s location based)? Are they located centrally or spread out across the region?
- What locations perform mammography and 3D Tomo procedures? How radiologists are dictating them?
- Are you using "manual merge" process?

Workflow Factors:

- Compare workflows between all VENDOR1 and VENDOR2 sites.
- Any workflow improvements requested with the conversion to VENDOR1 from VENDOR2 sites.
- Can we adapt current VENDOR1 site workflow as a regional level with minimum change?

Technical Factors:

Server locations, network and IT resource assignment were discussed.

Our AUH main site has a well-equipped Data Center so it was decided to host all servers at that location. The second most important was network between all of our facilities and this Data Center. We discovered that one of the facilities was about 150 miles away and did not have enough bandwidth. So that prompted IT department to have better network infrastructure in place. Other points were discussed as mentioned below.

- What is the current clinical image viewer at each site? How to migrate to VENDOR1 clinical viewer? Can VENDOR1 clinical viewer be leveraged for prior images?
- Are markups currently proprietary or GSPS?
- Where are orders currently stored? Do the images match up with orders on retrieve from archive?
- How are Demographic overlays, routing rules and keywords used?
- What existing integrations are in place? (Voice Recognition, HIS/RIS, backup/recovery system).
- What are the Pre-fetch rules/logic and archiving configurations?
- Are worklists based on locations, and if so are there fields capturing site codes?
- Diagnostic Reading Station Configurations at each site and Hanging Protocols.
- How many years' prior exams need to be migrated?

An Overview of Intervention Planning Technique:

These are the major points we focused in planning.

- Develop workflow based on current and future state discussion.
- Build and Test: Testing co-ordination and test issue resolution for application, integration and interface.
- Training for PACS Administrator on VENDOR1 PACS.

- Training for Radiologists and End Users on VENDOR1 PACS: Most of the radiologists were pre-trained through our existing VENDOR1 facility. Only few needed to be trained before and during go-live.
- VENDOR1 PACS installation and testing on Reading Stations, Clinical areas and modalities.
- All modalities to be built in VENDOR1 PACS and MWL server.
- Go-live dates validation and agreement with leaders: We picked two smaller VENDOR2 sites go-live first on same day and one larger VENDOR2 site go live a few weeks later. In both instance, everyone was agreed for midnight as the time to do switch over.
- Go-live communication throughout facilities: Radiology, ED, Surgery, Physician community, IT helpdesk etc.
- Go-live day and post go-live support model: We planned to have full on-site support for one week with multiple members from vendor, our own technical and PACS team.
- Transition to normal support model: After first week of post go-live, we should go on normal support model where users contact local PACS administrator and can be escalated as necessary.
- Lessons learned.

A Description of the Intervention That Took Place:

During one week before Go-live:

- Ensured all planning points are in check and covered – nothing is missing.
- Medical Staff Communication went out to ALL Physicians.
- Communication went to ED leadership, Surgery Leadership, HIM Leadership
- Communication sent to IT Director, Manager and helpdesk staff.
- Communication went to Radiology leaders, Supervisors and other members.
- End user training were completed on-site through vendor trainer. Training schedule was created based on vendor recommendation. Each session was about 2 hours unless more questions asked during training.
- Remaining radiologists were also trained.

On the night of Go-live: (Saturday night > Sunday early AM)

- 10:30 PM – PACS Admin along with two engineers on-site
- 11:00 PM – Modality and ER staff verbally notified about change of system at midnight
- 11:30 PM – Bridge call opened and made sure all respective server admin, network admin joined the call meeting.
- 12:00 AM (Midnight) – VENDOR2 PACS server shutdown. Those existing IP addresses routed to VENDOR1 PACS by Network engineer.
  - Modalities started to send images to VENDOR1 PACS. Users are able to login and view images successfully.

- o Checked with reading radiologist to make sure they are seeing this new facility exams in VENDOR1 worklist and they are able to read those studies normally.
- o Checked with ER physicians – they are able to login, view images, report etc. We stayed couple more hours to support, kept checking with users.

<u>Next day (Sunday)</u>
- 7 AM – Came back and did the same routine check, helped users, resolved any issues.
- Now we also had vendor support on-site so more people helping users – good outcome!
- Stayed until 6 PM – to cover morning as well as evening shift.

We continue this support cycle for one week with multiple people rotating (except ==PACS Admin== remained same every day!).

A Review and Discussion of Post-intervention Measurements:

During first week, every day an e-mail update was sent to leadership and key members. All issues were resolved during first week.

Post go-live lesson learned discussion was held. Here are highlights from that…

- What worked well?
    - o Speed of the implementation and excellent support team.
    - o Collaboration between onsite facility PACS resources, others and vendor.
    - o Training and workflow analysis - Training the end users in advance through vendor trainer was a key for end user acceptance of this new system.
    - o Leadership guidance, Radiologists participation and Project management.

- What did not work well, surprises or barriers did the team deal with?
    - o Just a few little, but consider the breadth of the project; I'd say they were insignificant.
    - o ==Network== issues occurred at go live, if we had more time with the ==Network== team- may be a separate weekly meeting, it would be less issue.
    - o Some of the Prior exams not being readily available.
    - o Some of the modality worklist were not working at go live.

- Is there anything that should be done for upcoming facilities?
    - o Overall, this is a fairly good template, may be a web based training option would help some staff members who can't come in for on-site training.
    - o More of a walk through with various users to see if everything is working properly. Sometime end users may not bring up the issues on the spot.

In summary – this project was extremely complex and yearlong but it went very well with an exemplary team work! It was very interesting for me and I learned a lot. The outcome is appreciated by everyone. It is truly helping our patient care and workflow.