

The health system's Division of Community Radiology (DCR) wanted a single system for their radiologists to use for providing services to the existing 4 DCR outpatient facilities and various outside contracted facilities. This would allow the group to work much more efficiently as each radiologist would be able to read cases from all of the facilities no matter where he or she was located. By giving all the group's radiologists access to all the studies from all the facilities, the group would be better able to balance the work and leverage each radiologists particular areas of expertise and better focus on stat and critical cases in real time across all their facilities.

The goal was a single RIS worklist, a single PACS viewer and a single dictation solution that would allow the group to easily add additional contracts and facilities without radiologists having to use any other systems.

The group selected Carestream as the single, central PACS and Nuance Powerscribe as the single dictation solution. The group then selected ThinAir Data TeleRIS for their single worklist solution and for all their HL7 connectivity between all the various systems and facilities. At present there are more than 30 separate HL7 sending and receiving connections.

In all the various workflows, ThinAir Data TeleRIS manages the significant issue of keeping track of and preventing overlap of all the MRNs and accession numbers in use at the various facilities. The basic workflow of the system is as follows

- ✓ HL7 orders and ADT messages are sent from the RIS in use at each facility to ThinAir Data TeleRIS.
- ✓ TeleRIS sends an HL7 order to the central Carestream server and to the Carestream "agent" server at the respective facility. This enables pre-fetch of relevant priors. Because a master patient identifier is used, relevant priors can be pulled from multiple facilities.
- ✓ The various facilities send their images to the Carestream "agent" at their facility.
- ✓ Upon receipt of images, Carestream sends an HL7 notification message to TeleRIS. This updates the status in TeleRIS allowing DCR staff to monitor the real time progress of order and images.
- ✓ TeleRIS "matches" the DICOM information from Carestream to the RIS information from GE.
- ✓ When technologist marks study complete in their local RIS, an HL7 message is sent to TeleRIS.
- ✓ TeleRIS sends an HL7 order message to Powerscribe.
- ✓ TeleRIS updates the status and makes the case available to the radiologists in the TeleRIS worklist.
- ✓ When radiologist selects order in TeleRIS worklist, TeleRIS automatically launches that study in the Carestream viewer.
- ✓ When radiologist is ready to dictate, he or she clicks the Dictate button in Carestream which launches that study in Powerscribe.

- ✓ When radiologist signs report in Powerscribe, an HL7 result message is sent to TeleRIS. The results workflow fully supports resident workflow, associated results and addendums.
- ✓ TeleRIS loads the report and sends HL7 result messages back to the RIS for that facility and to the Carestream agent at that facility and to the central Carestream server.

There were a series of special requirements of this project which ThinAir was able to provide solutions for.

DCR provides services at 4 outpatient centers of the main health system with a fifth being added in December of 2012. Patients being imaged at one of these five centers often have had studies done at one or more of the health system's 3 main hospitals in the area.

A significant goal of the group was to provide the group's radiologists a real-time view of all the current and historical reports done on each patient across all eight facilities. The health system's main information system does maintain a master patient identifier (MPI) for each patient across the 8 facilities which is independent of the MRN in use at each facility.

TeleRIS is able to utilize both the MRN and the MPI for these eight facilities without impacting how the MRNs and/or MPIs are used at the other facilities DCR is reading for.

Prior to go live millions of historical reports from the main health system were loaded into TeleRIS. Each day, TeleRIS continues to receive all the reports being created at the health system's 3 main hospitals. This assures that when a new order from one of the health systems's outpatient centers is read that the radiologist has a complete historical view of the patient's imaging records. As of November 2012, more than 5.7 million reports are in the TeleRIS database.

To further leverage the MPI and provide quick access to all the images accompanying these current and historical reports, DCR wanted to be able to trigger an intelligent pre-fetch of images when orders were placed at the various outpatient centers.

Working with Carestream, TeleRIS was able to provide a custom message to Carestream to trigger the pre-fetch DCR desired.

To provide radiologists with an even broader real time view of the patient's history, DCR wanted to provide radiologists with a quick and easy way to access the full clinical information systems in use at the various hospitals.

TeleRIS was able to provide a single "Clinical Info" link that automatically launches the particular clinical information system\EMR in use at the facility of the selected case. The radiologist does not have to take any special action. The link automatically activates the correct clinical information system for that order.

Some of DCR's larger referrers have full blown EMR systems and DCR wanted to provide them real time electronic upload of their patients reports into the respective EMRs.

TeleRIS was able to provide functionality so as each report is done, TeleRIS automatically checks to see if the ordering physician is part of one of the “EMR groups”. If so, an additional HL7 result message, structured to that particular EMR’s requirements, is generated and sent in real time to the EMR.

This functionality was recently expanded to include the reports being generated at one of the health system’s 3 main hospitals.

Following successful implementation of the first phase of the project, DCR and ThinAir began working on Phase 2 of the project.

The first element of Phase 2 was DCR moving from an older version of Powerscribe to Powerscribe 360. This has been successfully accomplished.

The next element was to add 2 fully contracted hospitals that are not part of the main health system.

These hospitals, of course, each have their own RIS, PACS and clinical information systems. The integration TeleRIS provides brings cases from these hospitals into the central reading system seamlessly. All the radiologists are able to read all studies from these hospitals using the exact same TeleRIS worklist and workflows as they do for the DCR facility reads.

ThinAir Data, Carestream and Nuance worked smoothly together on the necessary modifications to assure the MRN and accession number schemes at these hospitals would not adversely impact the central reading system. ThinAir Data made additional modifications to support the different workflows in place at these hospitals.

To leverage Carestream’s distributed architecture to provide quickest access to images in the Carestream viewer, ThinAir Data tapped its “launcher matrix” functionality. When radiologists log in to TeleRIS, they indicate where they are located. Based on that location, TeleRIS automatically launches the images for that study using the Carestream “agent” server at that radiologist’s location

Also a part of Phase 2 was to add resident workflow enhancements. The TeleRIS-Carestream-Powerscribe 360 combination now includes full resident workflow support.

Another recent element of Phase 2 of the project is the addition of a fifth DCR outpatient facility. Because of the existing TeleRIS design, this facility will merge seamlessly into the existing workflow.

The final element of Phase 2 is DCR adding smaller facilities who do not provide an HL7 order. The ThinAir-Carestream integration fully supports this workflow as well. TeleRIS is able to create orders solely from the study arrival notification message it receives from Carestream. Staff at these smaller facilities can log in to the TeleRIS web portal and see their orders already created by the ThinAir-Carestream integration. Once staff validate and confirm their order, the order is sent to Powerscribe and made available to the radiologists – again using the same worklist and workflow they use for all the other studies.

DCR’s reading system, centered around ThinAir Data’s TeleRIS single worklist and our HL7 integration expertise has allowed the group to utilize its radiologists more efficiently than ever. The system provides a robust platform for continual growth as they can continue to seamlessly add contracts and facilities.