# Interfaces – the Social side of Equipment and Systems

Often, we can feel like someone is speaking a foreign language when they start talking about Interfaces. Just like a language, we can learn a few key terms and common methods to make it easier to understand. Here's a guide to how the standards and work flow of interfaces can help your facility's systems and equipment communicate to improve your efficiency and bottom line. Saving a few minutes per procedure can quickly add up to enough time to add in extra procedures or see additional patients to increase your revenue.

STANDARDS: People communicate using sound (voice, music, sound effects) or visually (letters, e-mail, text, etc.) Equipment and computer systems communicate using Interfaces. Different types of interfaces handle different types of information and follow different communication standards. For example, medical images use the DICOM (Digital Image Communication in Medicine) standard while patient demographics, orders, and billing information use the HL7 (Health Level 7) communication standard.

Just like people get more done and more efficiently if they communicate with each other, our systems and equipment become more efficient and effective if they communicate with each other. The better the communication, the more easily the work seems to 'flow' through our organization. Let's look at the journey of a typical radiology patient record.

The patient visits their physician and fills out a Patient History, Insurance forms, etc. These records get added to their Electronic Health Record (EHR) or Electronic Medical Record (EMR) – what used to be their paper jacket. The physician may order lab tests and/or imaging to be done to aid in diagnosis. The order is sent to the appropriate system(s) via HL7.
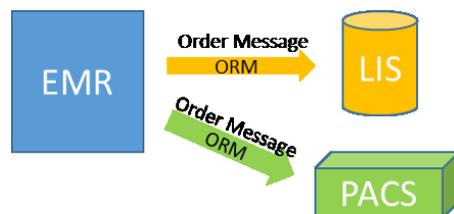
An Order Message includes information on:
- The sending application (for example, the EMR)
- The receiving application (LIS or PACS here)
- The Patient ID (this can be different from the Account ID)
- The Exam ID (Accession #, Visit #, or Study ID)
- The Procedure or Test to perform

Different systems and facilities sometimes refer to the same piece of information by different names. For example, a patient going to have imaging done will have an Exam ID for each type of imaging. An Exam ID can also be referred to as a Study ID, an Accession #, or a Visit #, but the patient will have different Exam IDs for a set of x-rays and an ultrasound exam even if both sets of images are created during one visit to the facility. We would typically receive separate orders for those.

Orders can include 'Grouped Procedures'. For example, x-rays of the neck, chest, and abdomen fall under different procedure codes, but can be imaged together to save time while the patient is there.

MODALITY WORK LIST (MWL): When the patient arrives for their imaging, the technician operating the imaging equipment (modality) can select the patient from a Modality Work List to save time and avoid possible typos. The Modality Work List (MWL) is a list of orders for that modality for that day. The modality must send a Query to the PACS or EMR requesting the Modality Work List.

The Modality Work List (MWL):

- The modality queries for any orders for that type of modality (for example, any CT's for today?)
- The application queried sends a list of any orders matching the query
- The tech selects the appropriate order when the patient arrives and the patient, exam, and procedure information is automatically filled in.
- The imaging is performed and sent to the PACS.

When the PACS receives images done from a Modality Work List, they will automatically match the Order already in the system and update that exam. We then see an exam in the user's work list that is ready to be read.

When exams / test results don't match orders

Sometimes we see exams or test results that don't match with the orders that were in the system for them. These are generally due to one (or more) of the following:

- Patient ID doesn't match the order – this can occur if
  - Someone types in the ID wrong on the modality or instrument
  - The Patient ID and Account ID are different and the wrong one is filled in
  - There is an unexpected space or other character in the ID
- ExamID / StudyID doesn't match the order – this can occur if
  - Someone types in the ID wrong on the modality or instrument or leaves it blank (some systems will assign a number to any that come in without one)
  - There is an unexpected space or other character in the ID
- Procedure or Test Code is missing or doesn't match
- None of the above match an order because the Order is from a source that the modality does not get a work list for
  - Facilities that have orders created in house and also receive orders from outside physicians/facilities won't have the outside orders in their internal EMR. Consider an HL7 interface to the PACS from all the sources of your orders and have the modality query the PACS for the Modality Work List. That way they can get any orders you have, not just your internal ones, and all exams match up.

Exams / Test results that don't match the orders must be manually reconciled to process through properly and be available to personnel.

Images received in the PACS are either immediately available for any physicians or staff members to view in order to make treatment decisions or go into a QC state, depending on your work flow. The Reading Radiologist will view the images and dictate a diagnostic report with his/her findings. Depending on how the workflow is set up, that diagnostic report may be sent to the EMR first, then passed to the PACS or may come into the PACS first and be passed to the EMR.

SPEECH RECOGNITION: More and more reading groups are using Speech Recognition software such as PowerScribe, Dragon Naturally Speaking, etc. for automatic transcription of their diagnostic reports as they dictate it. These systems can interface with your EMR or PACS to send the reports to them and the one who receives it can pass a copy to the other via HL7.

Some information can be passed using either communication standard depending on what format it's in. For example, a radiologist's diagnostic report may be in a DICOM Structured Report or DICOM PDF format and be passed using the DICOM standard; or it may be in a text format and be passed in an HL7 message.

INCLUDE ADDITIONAL INFORMATION: Often facilities have scanned documents, text notes and reports, and other pieces of information stored on exams. With ASPYRA's PACS, you can have sensitive notes and scanned documents stored with Security on them to limit access only to personnel who are members of a specified group(s). You can also have the system automatically convert your scanned documents, notes, text reports, etc. to DICOM objects for burning to CD or sending via the DICOM standard to other systems. You provide more complete information to those who need it for diagnosis and treatment of patients.

MEANINGFUL USE: Interfaces between your systems can help with your Meaningful Use. For example, if your EMR can support it, ASPYRA's PACS can provide a URL link to exam images in an Order Update message to automatically tell your EMR that the exam is complete and the images are available at this location.

Better communication between your systems reduces the manual steps needed, reduces opportunity for errors from typos, improves your efficiency and patient throughput, and can aid in reimbursement by helping your Meaningful Use. Communications between your systems also helps you provide faster and more complete information to your referring physicians. Your facility and your patients benefit from these communications between systems and people.