

Technical Brief Series

DICOM Standards and Their Importance in Point-of-Care CT Imaging

The History of DICOM

With the introduction of computed tomography (CT) and other digital diagnostic imaging modalities, the American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA) recognized the need to establish a standard method for transferring images and associated information between devices manufactured by different vendors.

In 1985, the first standard was published (ACR-NEMA Standards Publication No. 300-1985). Since this time, a number of enhancements have been made to the Standard, now called Digital Imaging and Communications in Medicine (DICOM).

The DICOM Standard

DICOM is a global information technology standard that has been adopted by hospitals and imaging centers across the world and is making inroads into physician practices. It is designed to ensure interoperability of systems used to capture, store, display, send, process, retrieve, query and print medical images as well as manage related workflows.

DICOM, therefore, enables the integration of equipment from multiple manufacturers into a picture archiving and communication system (PACS). DICOM is required by all Electronic Health Record (EHR) systems that include imaging information as an integral part of the patient record.

DICOM Data Format

DICOM differs from some data formats in that it groups information into data sets. That means that a CT image file, for example, also contains the patient ID so that the image can never be separated from this information by mistake. It

also allows collaboration with others via embedded reports and measurements.

DICOM Services

DICOM consists of many different services, some of which involve transmission of data over a network. DICOM conformance statements indicate the DICOM services that are supported by a vendor. Below are selected services:

- **Store** – this is used to send images or other objects (reports, etc.) to a PACS.
- **Storage Commitment** – this is used to confirm that an image has been permanently stored in a remote storage device, making it safe to delete the images locally.
- **Query/Retrieve** – this enables a workstation to find lists of images and retrieve them from a PACS.
- **Modality Worklist** – this enables a modality to obtain details of patients and scheduled exams electronically, avoiding the need to type information multiple times.
- **Print** – this is used to send images to a DICOM printer. A standard calibration is used to help ensure consistency between various display and printer devices.

Who Benefits from DICOM?

Physicians have better access to images and reports when DICOM standards are in place. This allows them to make a faster diagnosis, potentially from anywhere in the world.

Patients can potentially obtain faster and more effective care when the DICOM standard is used to send their information through the healthcare enterprise.

Payers benefit from faster, more effective processes that can potentially lower their cost of care.

White Paper | DICOM Standards and Point-of-Care CT Imaging

The Benefits of DICOM

By purchasing only equipment and information systems that conform to the DICOM standard, you can ensure that imaging devices and healthcare IT systems will seamlessly work together to capture, manage, store and distribute your images regardless of your previous, current or future vendors.

Since the 1980's, Carestream has worked to ensure that CARESTREAM medical imaging and healthcare IT solutions, such as the CS 9300, conform to DICOM standards.

Physicians considering the purchase of a point-of-care CT system should ask vendors whether they utilize standard DICOM data formats and also request the vendor's DICOM conformance statement outlining the DICOM services that are supported.