

CD Image Import Reduces Unnecessary Imaging Exams in Emergency Rooms



Each year, more than two million critically ill patients are transferred from one hospital emergency department (ED) to another for appropriate care. With the ability to successfully import data from a CD-ROM containing the patient's diagnostic medical images, hospitals may be able to significantly reduce unnecessary medical imaging tests, some of which expose patients to radiation.

These findings are reported in a new study published in the July issue of *Radiology*. According to researchers at Brigham and Women's Hospital in Boston, the implementing a system to upload CD images of emergency transfer patients into the receiving institution's picture archiving and communication system (PACS) decreased the rate of subsequent imaging by 17 percent.

"Because there is no central repository for medical images or a large-scale system to transfer images electronically between hospitals, a CD with diagnostic imaging is among the most critical components in the hand-off of clinical information for patients transferred between hospitals," said lead researcher Aaron Sodickson, M.D., Ph.D., interim director of emergency radiology at Brigham and Women's Hospital. When CD images are imported into PACS, the images can be efficiently reviewed by multiple members of the healthcare team, even if they are in different locations. When the receiving hospital does not have that import ability, or when an import is unsuccessful because a CD is damaged, lost or in a non-standard image format, repeat imaging is often performed.

"We know that a substantial portion of imaging performed on ED transfer patients is repeated at the receiving institution, which drives up healthcare costs, delays patient care and often exposes patients to additional ionizing radiation and intravenous contrast material," Dr. Sodickson said. In July 2008, Brigham and Women's Hospital implemented a system to import outside imaging sent on CD into the institution's PACS 24 hours a day. Receiving physicians were required to place a CD import order with the patient's history in the hospital's electronic radiology ordering system and deliver the CD to the emergency radiology support staff, who would subsequently import the CD contents into PACS using a software application that identifies and imports Digital Imaging and Communication in Medicine (DICOM) format files.

For the study, researchers reviewed the medical records of 1,487 consecutive patients who were transferred to the Brigham and Women's Hospital ED between February and August 2009 with a CD containing medical images acquired elsewhere. CD import to PACS was attempted for all patients and was successful for 1,161, or 78 percent, of the patients. Incompatible image formats or CD malfunction resulted in 326 unsuccessful CD imports. Compared with the patients whose imaging could not be imported, patients with successfully imported CDs had a 17 percent decrease in imaging rates during the subsequent 24 hours (2.7 versus 3.3 exams per patient) and a 16 percent decrease (1.2 versus 1.4 scans per patient) in subsequent CT scans.

"Implementing CD import procedures has provided us with a far more efficient way to take care of our patients," Dr. Sodickson said. Extrapolating these results to the approximately 2.2 million patient transfers between American EDs each year, the estimated annual reduction in CT utilization due to successful CD import to PACS would be on the order of 484,000 CT scans.

"One of the goals of our healthcare delivery system must be to provide access to diagnostic imaging results to all locations involved in a patient's care, either through implementation of a universal electronic medical record, image repositories, or robust image transfer networks," Dr. Sodickson said. "But until those solutions reach maturity, ensuring that medical images can be downloaded from CDs in a standard, PACS-compatible format will help to streamline care, reduce costs and protect patients from unnecessary imaging exams."

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