Study validates low-cost analog teleradiology

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A paper documenting five years of experience with the system concludes that the analog image transfer apparatus used for ordinary telephone data transmission delivers image quality adequate to triage neurotrauma patients (J Telemed Telecare 2008;14:67-70).

"In the daily practice of emergency neurosurgery, initial image quality is less important than receiving quick, reliable neurosurgical consultation," said Dr. Juergen Kreutzer of the neurosurgery department at the University of Erlangen-Nuremberg.

The quality of images transferred over the analog system was adequate to identify the location, size, and extent of pathological structures from a neurological standpoint, according to Kreutzer.

"Evaluation of gray and white matter, supratentorial edema, ventricle size, or midline shift was sufficient and reliable," he said. "Neurosurgical consulting was reliable and quick, relevant to the question of whether immediate hospital admission and further inpatient evaluation were necessary."

Kreutzer retrospectively analyzed 1024 neurosurgical cases between 1995 and 2000 involving the relatively unsophisticated analog image transfer system (CP220, Vetter-Vaillinger, Ostfildern-Nelligen, Germany). It was used to transmit CT and MR scans from the emergency departments of seven small hospitals located in southern Germany to a regional neurosurgical center.

The study found that in 67% of the cases, patient ground transportation and subsequent hospital admission were not necessary, saving the healthcare system over $535,000. Equipment purchase price of the image transfer system was $16,800 per hospital.

"Without a teleradiology system, smaller hospitals are virtually forced to arrange expensive transportation to the nearest neurosurgical center," Kreutzer said.

None of the seven affiliated hospitals had a neurosurgical consultant on call, and most did not have a radiologist on call.

The problem with more expensive DICOM teleradiology systems is they require hardware in every connected peripheral hospital, Kreutzer said. Such systems offer high-quality image transfer but require frequent technical servicing, presenting compatibility issues and judicial concerns over patient confidentiality.

Data transmission speed over the analog system was acceptable in its design context. Transmission of one image over the 19,200-baud telephone network took approximately 20 seconds. Receiving a complete cranial scan was possible in three to four minutes, he said.

Disclosures:

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