

Long Days Make Radiologists Less Accurate

Cheryl Clark, for HealthLeaders Media, September 17, 2010

The ability of radiologists to detect fractures after a day of viewing images declines significantly compared to their diagnostic accuracy at the start of the day, according to a report published this month in the Journal of the American College of Radiology.

The authors, from the University of Arizona in Tucson and the University of Iowa in Iowa City, measured reads of 40 attending radiologists and radiology residents as they viewed 60 bone exams, half with fractures and half normal.

"Because of increased visual strain...radiologists' ability to focus on images was reduced making them less accurate after a day reading diagnostic images," wrote lead author Elizabeth Krupinski, PhD, and colleagues. The radiologists had increased symptoms of fatigue and oculomotor strain.

Although the report notes difference in accuracy was about 4%. The reduced accuracy in later reading included about the same increase in false positives as there was a decrease in true-positives. In other words, errors included incorrectly diagnosing fractures that didn't exist and missing those that did.

"Radiologists need to be aware of the effects of fatigue on diagnostic accuracy and take steps to mitigate these effects," the authors wrote.

The researchers hypothesized before the study began that radiologists would compensate for their fatigue by taking more time. "This did not happen. Accommodation accuracy (the process by which the eye changes focus) was reduced, reading time was the same. Viewing time was unchanged late in the day and time to report fractures was no different."

The study took into account at what time the radiologists woke up on the day of the experiment, how many hours of sleep they'd had, how long they had been reading cases that day, the number of cases, what percentage of them had colds, allergies and itchy or watery eyes, and what percentage had used eye drops.

The authors described several study weaknesses. Only radiology exams were used but CT and MRI exams contain hundreds of images that must be scrolled, potentially more fatigue producing than looking at static images.

Krupinski and colleagues also noted, "Many radiologists work more hours than we studied. Even when sleep loss is not a factor, some radiologists work considerably longer on a given day than those in our study.

"Given that a small but significant reduction in detection accuracy was demonstrated for an average workday of about 8 hours, we suspect that more extended reading may expose the reader to greater decrements in accuracy."

With the increase in teleradiology and remote group radiology reading for rapid diagnostic response in healthcare settings, especially hospitals, the issue may have some worrisome implications for maintaining high accuracy rates necessary to maintain and improve quality of care.