Are Digital Chest X-rays Good Enough?

To the Editor:

I am writing about the growing use of digital radiography (teleradiology) for chest x-rays. I solicit responses from other more knowledgeable chest physicians regarding their experience and recommendations for this new technology.

One of my community hospitals has for 2 years had such a system in its emergency department (ED) and plans to extend its use throughout the institution. My experience with this system has been disappointing and frustrating on many occasions. This has held true whether I have viewed images on the monitors, in the ED, in the radiology department, after transfer to film (in small or large format), with or without radiologists' consultation. The images appear grainy and of low resolution. I frequently find it impossible to distinguish these artifacts from important pathologic findings such as congestive heart failure or interstitial infiltrates. With gross and obvious findings, these images are "okay." With subtle findings, I have found them woefully inadequate and universally have had to repeat with a standard film the next day. Furthermore, the limited number of monitors at a workstation (two) makes it impossible to compare a series of films side-by-side, thus getting a very important clinical tool.

I have worried about this system since I began using it and have questioned its validity. I have been told, "Oh, you just have to get used to it!" and "You have to fiddle with the dials." I have been admonished that "This is the wave of the future" and that "All the studies show this is better than standard films." While I am not a radiation physicist, radiologist, or computer imaging expert, something just did not seem right.

So I did a Grateful Med search hoping to find lots of large clinical studies, but did not. I found a 1997 Norwegian study1 of 120 chest x-rays that concluded, "We found the accuracy and sensitivity of the teleradiology system to be clearly inferior to film evaluation." The recent German work2 studied high spatial resolution images such as chest x-rays and low spatial resolution images such as liver CTs. In conventional light-box reading to digital images in 446 cases, "there was a noticeable loss of diagnostic accuracy for the high spatial resolution films . . . ."

The hospital's digital x-ray system has been featured on television and has engendered favorable publicity. I understand that file rooms, film storage, and associated personnel are very costly and that electronic data storage is ultimately less expensive. I acknowledge the financial realities of 1997 and the great pressures placed on hospital administrators (and the professionals who now work for them) to cut costs. I too can feel the excitement for the avant-garde wizardry of digitized images.

Different types of images may be more or less suitable for digital technique in present state of the art. Our system may or may not be the finest available. I may be inadequately trained using the system. Before launching major new technology and abandoning the traditional standard, I hope the new systems will be validated clinically in prospective, randomized, controlled, clinical trials. I look forward to assistance from the readership.

Bennett E. Ojserkis, MD, FCCP
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REFERENCES

The ABCs of Chest X-ray Film Interpretation

To the Editor:

Learning to interpret the routine chest radiograph is an important task for all students of clinical medicine. It is a test that is commonly ordered, readily available, relatively inexpensive, and offers a tremendous amount of pertinent information to aid in medical decision making in a wide variety of clinical circumstances. However, the information is provided as a complex two-dimensional collection of shadows that require a considerable degree of skill to interpret. To the beginning student, the usual advice to "be systematic" so as not to miss any important findings is sensible, but often of little practical value.

To aid our residents and medical students in their endeavor to develop skills at interpreting the chest radiograph, we have employed the alphabet as a simple learning tool. To be certain, this, or variations on this theme, must have been employed elsewhere, and we therefore make no claims to originality. Still, we have found our specific use of an alphabetical mnemonic to be of value as both a teaching and a learning tool.

In approaching the chest radiograph, either frontal (posteroanterior or anteroposterior) or lateral projections, the reader is asked to assess the quality of the film and then resist first focusing on the lung fields in favor of the systematic, alphabetic approach outlined here:
A—Airway and adenopathy: Review the airway, inspecting the