

Digital Imaging Is Here: Time to Do Away With Your Darkroom Forever!

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Traditional methods of taking X-rays and processing X-ray film are soon to become things of the past. One of the largest expenses for the chiropractor and their practice is the X-ray machine and the equipment necessary to run their darkroom. The X-ray machine is a one-time expense; however, the maintenance expense for the X-ray processor and darkroom can now be eliminated with the advent of new digital X-ray equipment.

Digital X-ray imaging has been present in the medical community for over two decades, but has not been a cost-effective option for the private marketplace. Most digital X-ray systems in hospitals are in the \$300,000 range and above - well beyond the reach of a private practitioner. Today's new digital equipment will allow the practitioner to retrofit a computed radiography (CR) system to an existing X-ray machine in the chiropractic office.

What Is Digital X-Ray Imaging?

Digital X-ray uses a sensor to replace film and a computer system to view the final images in a matter of a minute or two after the exposure is made. Fundamentally, there are three types of digital X-ray systems currently available, with pros and cons for each system:

- Direct Radiology (DR) Flat Panel Systems are digital systems that use sensor grids and flat panel technology instead of cassettes or scanners. These images have been used in hospitals for quite a long time and can produce near-instant images within three to five seconds. One of the great advantages is the speed at which the images can be acquired. However, the DR systems are very expensive (in the \$175,000 range or more) and are not practical for the private practitioner.
- Charged Couple Device (CCD) Systems use one or more high-megapixel cameras to capture an image. The image is captured directly from an illuminating plate with a field of view of up to 17 "x 17," replacing the traditional cassette and film combination. The digital image from the CCD camera is imported directly into a software program that allows for manipulation and storage. These systems are now more affordable to the private practitioner (\$85,000 range)
- Computed Radiography (CR) Systems can be retrofitted to any X-ray equipment, no matter what company manufactured the X-ray system, whether single-phase or high-frequency technology (HF is preferred). This system uses a cassette similar to your film-based process. The difference is that with the CR system, the cassette has a reusable phosphor plate that captures the X-ray photon's energy and stores the latent image. The plate must then be placed into a scanner to convert the latent image into one that can be viewed on a computer monitor. After the information is sent to the computer, the plate is erased and then replaced into the cassette.

Some CR systems automatically load, erase and unload these plates; other systems do not. The systems that automatically load and unload are preferable, as they eliminate the chance of damage or breakage of the phosphor plate during human transfer. Also, some CR systems use a drum to transfer the plate through the reader; these are not favorable, as they tend to deteriorate the

phosphor plate due to bending motions within the reader. Most of these plates last for approximately 10,000 exposures or more. The CR system can be retrofitted to a standard X-ray installation for approximately \$40,000.

Main Advantages of Purchasing a Retrofitted CR System

1. Eliminates the purchase of X-ray film (a significant ongoing expense).
2. No film to process in the darkroom.
3. No film processor to maintain.
4. No chemicals or solutions to store or purchase.
5. The elimination of the darkroom frees up valuable "real estate" within your practice.
6. Biomechanical measurements can be placed on the images with mensuration and various angles being given immediately by the computer software offered with the CR system.
7. Virtually no repeat X-rays, thus reducing patient exposure.
8. Image quality is far greater than standard radiography, since you can manipulate the density and contrast with the use of the computer.
9. The ability to send images over the Internet to a chiropractic radiologist for review increases the quality of patient care and eliminates the hassles of postage and/or overnight carrier express delivery charges.
10. The ability to print paper images to place in the patient's file.
11. Eliminates the need for reproduction of X-rays, since the entire study can be copied to an inexpensive CD and given to the patient or passed on to a referred doctor.
12. The ability to magnify the image without any loss of image quality or resolution.

Conclusion

It is time for chiropractors to join the future of human diagnostic imaging and become more efficient in the delivery of their X-ray services. Doing so will enable practitioners to spend less time to acquire consistently diagnostic images and to interpret those images, giving them more time to deliver patient care.

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