

### Computed Radiography (CR)

CR systems represent an interim step in the transition to digital imaging. The technology eliminates the use of the film, but still requires some time-consuming operations. The film cassette is replaced with a phosphor plate that captures the x-ray, and is then placed inside the CR reader, which creates the digital version of the image.

CR is a simple and affordable choice, as it is compatible with most existing x-ray systems still in use today. For this reason, the CR system is suited for smaller practices that want to transition to digital, but aren't prepared to purchase a complete direct digital system right away.



*A CR Workstation System is ideal for smaller practices, as it presents the most affordable transition from film to digital x-ray.*

### Direct Radiography (DR)

Like CR, DR systems eliminate the use of film as well. But while the CR requires extra image conversion equipment, the DR eliminates this need. In a direct radiographic system once an image is captured by an electronic sensor, the digital image is sent *directly* to your PC and is ready for immediate viewing. This is the most cutting-edge technology on today's market, and it produces images of the highest resolution. At the same time, the superior speed of image acquisition (only a few seconds)

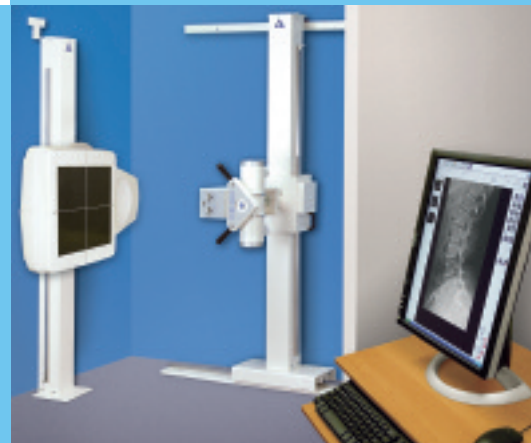
substantially expedites the diagnostic process. While the cost of a complete DR system is understandably higher than CR, the direct digital technology provides a service advantage that easily justifies the cost – especially for clinics that rely on a superior quality of care and efficiency.



*Direct radiography is state-of-the-art technology that provides all the benefits of digital in one seamlessly integrated package.*

**Naturally, you can upgrade a film-based system to either CR or DR in accordance with the needs and the long-term business objectives of your practice.**

Find more information on digital imaging at:  
[ChiroWeb.com](http://ChiroWeb.com)  
[AuntMinnie.com](http://AuntMinnie.com)



**Call us today to schedule a demonstration and find out how digital imaging will add immediate value to your practice.**

**800-641-4107**  
**[www.HCMI4Chiros.com](http://www.HCMI4Chiros.com)**

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think

**DIGITAL**

## GUIDE TO DIGITAL IMAGING



### Making The Right Choice

At HCMI, Inc. – the company dedicated to the Chiropractic profession – we believe that objective information is the key ingredient of the decision-making process. Understanding that the purchase of an x-ray system is one of the biggest expenses for any size practice, we'd like to help you make an educated decision and choose the solution that's right for you.

This Guide was created to offer you a convenient and informative reference to all the essential facts you need to know about the transition from a film-based to a digital x-ray system.

We're confident you'll find plenty of helpful tips and useful ideas that will elevate your quality of care and unlock the full potential of your practice.

### The Fundamentals Of Digital X-ray

#### The same electromagnetic wave you know

The electromagnetic process by which x-ray images are produced is similar in both digital and analog systems. The key difference is in how the image is *captured* and *displayed*. In both systems, the radiation that passes through the tissue creates a shadow of the internal structure of the body. Tissues that are denser tend to absorb more of the x-ray, while less dense tissues, such as internal organs, allow much of the x-ray through. At this point, in order to view the "shadow" the radiation must be captured and converted to an image. This is where digital systems begin to separate themselves from analog.

Traditional analog x-ray systems capture the image by exposing film, which must then be developed using a darkroom and development chemicals. This can be both a costly and time-consuming process. Digital x-ray, however, does not require film or its subsequent development. Instead, the image is captured using one of a variety of methods, and is then quickly converted to a digital image that can be viewed and manipulated on a connected PC and monitor.

Sounds simple, right? But just how exactly is the x-ray "quickly converted" to a digital image? To understand that, one must first know the two basic forms of digital image acquisition available – *computed radiography* and *direct radiography*.

## THE BENEFITS OF DIGITAL IMAGING

The superiority of digital technology translates into a long list of functional and tangible benefits that add immediate value to your practice and directly enhance your bottom line. So grab a pencil and check the advantages that you'll find most useful and applicable to your practice.

### Improved patient care

The first and most important advantage of digital technology is the elevated quality of care. The range of the digital receptor allows discovery of pathologies that may not be found with other systems, so you have in your hands a much better diagnostic tool that provides for an immediate and precise diagnosis. At the same time, the short exposure time and reduction in re-takes increases patient safety because the radiation dose is limited by as much as one-third, without sacrifice in image quality. In short, the achieved higher standard ensures your patients' trust and satisfaction.

### Elimination of film

Digital x-ray directly eliminates the use of film, but more importantly, it eliminates the need of darkrooms and storage space, the processing and disposal of chemicals, time-consuming film duplication, and the retakes due to poor image quality. It also makes filing and file retrieval much more efficient. Consider all these savings as an integral part of the equation when deciding on a digital solution.

### Ultra fast image acquisition

As we all know, time is money. Thankfully, direct digital imaging is nearly instantaneous. Digital exams can be conducted 2 to 4 times faster than traditional film-based x-rays, so busy chiropractors can increase the number of patients seen each day. The image is ready to view within seconds and can then be instantly sent to a radiologist, stored on your hard drive or placed on CD or DVD for future review and back up.



### Superior image quality and enhancement options

The ability to manipulate the digital data exemplifies the superiority of digital x-ray imaging over analog systems. The advanced digital environment allows a doctor to...

- Enlarge the image
- Alter the contrast
- Alter the density
- Reverse the image (from negative to positive)
- Make exact digital measurements and add annotations
- Save the file in a near limitless number of variations
- Share images for consultations



...all with a click of a mouse. Interpreting the image is also easier because the digital medium allows the doctor to adjust aspects of the image that can cloud the view of the spine. Film is not capable of such manipulation.

Remember, as with any system there are many factors that will have an effect on the final image produced. The superiority of the digital x-ray technology alone won't compensate for poorly maintained equipment, operator error or faulty technique. We suggest you consult a competent HCMI expert to help you optimize the performance of your new digital x-ray system and enjoy its multiple benefits.

### Easy-to-use software and 100% compatibility

Performance and simplicity are key factors in a digital system's operation. Digital software is easy to use, and compatible with DICOM standards accepted by the industry. A digital system can function as a stand-alone imaging workstation or can be seamlessly integrated into an existing PACS system. In addition, digital systems make it easy to adhere to strict regulations such as the Health Insurance Portability and Accountability Act (HIPAA) and Health Level 7.

### What is DICOM?

DICOM (or Digital Imaging and Communications in Medicine) is a standard developed by the American College of Radiology and the National Electrical Manufacturers Association. The standard was established to meet the needs of manufacturers and users of medical imaging equipment for the exchange of data on standard networks. Already accepted across all medical fields, DICOM simplifies the development for all types of medical imaging. "DICOM-compatibility" simply means that different users of different imaging devices will be able to smoothly exchange information. (More info at <http://medical.nema.org>)

### What is PACS?

PACS (or Picture Archive and Communication Systems) is used by the radiology and diagnostic imaging industry to manage information and images electronically. The system is responsible for acquiring, transmitting, storing, retrieving, and displaying digital images and related patient information from a variety of imaging sources, and communicating the information over a network.

### What is HIPAA?

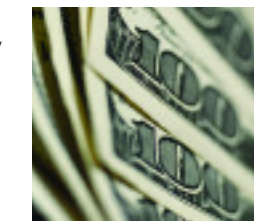
Adopted by the Department of Health & Human Services in 1996, HIPAA (Health Insurance Portability and Accountability Act) provides, among other things, greater privacy and protection of patient medical information. Because more and more information today is shared electronically, the regulation also pertains to how individually identifiable health information is transacted, and gives patients better access to their own medical records. (More info at <http://www.hhs.gov/ocr/hipaa>)

### What is Health Level 7?

Health Level Seven (HL7) is a not-for-profit volunteer organization, dedicated to creating unified standards for the exchange, management and integration of electronic healthcare information. In an atmosphere of consensus, openness and balance of interest, HL7 has developed compatibility specifications for medical software and equipment that enables a smooth exchange of clinical and administrative data. In short, the HL7 Standard was established to increase the effectiveness and efficiency of healthcare data delivery for users of different technologies. (More info at <http://www.hl7.org>)

### Cost advantages of digital vs. film

At first glance, the transition to digital imaging can seem like a major capital expenditure. But with a careful analysis of the bigger picture, you'll discover that digital x-ray actually costs less than using film. With increased speed and performance, digital x-ray is simply much more efficient than systems based entirely on film. Add to that the elimination of film canisters, development chemicals, and the space needed for darkrooms and storage; and it's easy to see that, over time, cost clearly favors the digital format.



### Comparison Table

Supporting equipment and supplies needed to create an image.

	Film	Cassettes	Darkroom	Development Chemicals	Development Equipment	Film Storage	Light Box	Chemical Disposal
Film	X	X	X	X	X	X	X	X
CR		X			X, CR Reader			
DR								

### The Choice Of Forward-Thinking Chiropractors

The future of radiography is in digital. Regardless of the system you choose—DR or CR—digital imaging has the potential for tremendous costs savings, enhanced patient diagnosis and spectacular clinical efficiency. Of course, x-ray equipment is not an every day purchase, so every practitioner has to select the return-on-investment option that is acceptable for his or her individual practice.

Our comprehensive products portfolio offers a full line of top quality x-ray equipment – from film-based, to CR and DR systems. Visit our website – [www.HCMI4Chiros.com](http://www.HCMI4Chiros.com) – and see all the options that can enhance your bottom line.

Again, in choosing which system will be right for you, it's important to consult an expert who'll evaluate the particular needs of your practice. So contact an HCMI specialist today and discover how we can make your adoption of digital x-ray cost-effective, smooth and easy.