

Practice Management

Technology in Urgent Care: Digital or Conventional Imaging?

Urgent message: More and more urgent care clinics are wrestling with whether to offer digital or conventional x-rays. In this article, Registered Technologist Trip Hale offers expert advice on how to make the decision.

TRIP HALE, RT, (R)

Introduction

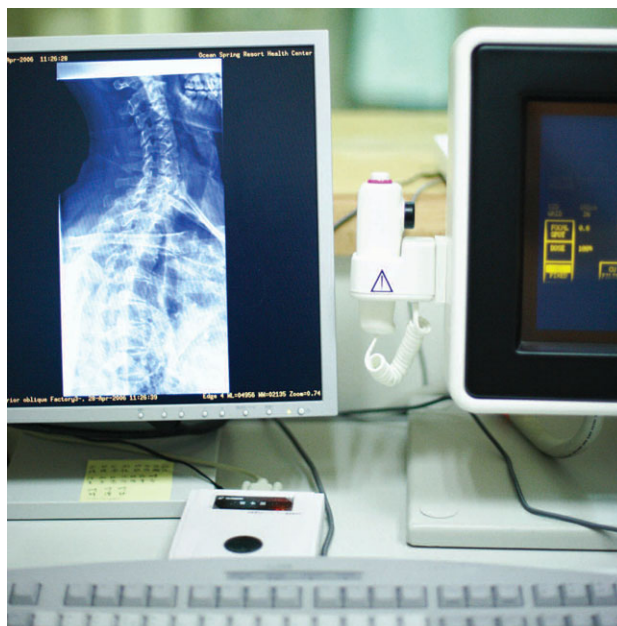
For today's urgent care clinics, imaging is an integral part of providing complete diagnostic and treatment services. Because reimbursement for diagnostic studies is lower for physician-owned than for hospital or outpatient imaging facilities, a well-planned and efficient imaging area is a must. With advances in image capture devices and more user-friendly x-ray units, it is possible to achieve outstanding image quality on a very modest budget.

This article will explain the differences between the two primary types of digital imaging and the advantages that digital technology can offer an urgent care practice. The box on page 20 provides a comparison of cost of ownership for x-ray imaging with digital vs analog technology for a new or start-up urgent care practice.

Understanding Imaging Modalities

The two primary types of digital imaging are computerized radiography (CR) and direct radiography (DR).

CR technology utilizes image plates with various types of phosphor material, which are housed in a traditional cassette. The cassettes come in various sizes, and fit in standard trays for x-ray tables and wall stands. Once the material is exposed, the cassette is inserted in a digitizer and a



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laser scans the image plate. Processing times range from 45 to 180 seconds per plate. Manufacturer-specific algorithms are used for processing to produce a digital image. CR images typically are stored in the standard DICOM (Digital Imaging and Communications in Medicine) format.

With *DR technology*, the detector is directly x-rayed. This eliminates the need for cassettes or a digitizer. DR

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technology combines speed (image acquisition in 4–20 seconds) with superior image quality. DR typically is more expensive to purchase and maintain, but the cost gap is closing. As with most high-tech products, supply and demand determine price. DR detectors come in a variety of configurations from charge-coupled device (CCD) to thin film transistor (TFT). DR panels can be either fixed devices or portable. For the urgent care market, portable panels usually have a tether or cable connecting the panel to the acquisition computer. With a tethered portable panel, a special housing cabinet replaces the typical bucky or grid cabinet.

Benefits of Digital vs Conventional Imaging

Digital technology has a number of advantages over conventional imaging, including higher quality, more flexibility in image manipulation, and greater storage capacity.

Consistent image quality. Because digital images have a much higher dynamic resolution range, more latitude is possible in image quality. As long as exposure factors are within plus or minus 30%, current algorithms will produce a good image.

Image manipulation. Digital images have very large data sets (10–16MB per image). Because there is so much data, images can be magnified, the contrast and density adjusted, and annotations added to allow better diagnostic qualities.

Reduced construction cost. No darkroom or file room space is required for digital imaging and the total square footage needed for an imaging area is reduced by about 30%. There is no need for plumbing or electricity for a film processor

Availability of images. All digital modalities can be stored electronically and made available immediately on a typical personal computer. Image quality is very good when displayed on a standard 1.5-mp monitor. If you use larger monitors, be sure to consult with an IT professional to ensure that the resolution is set properly and the right graphics card is installed.

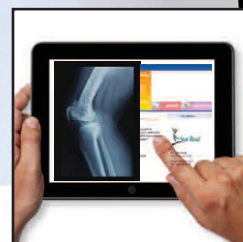
Integration with electronic medical records (EMR). As digital imaging continues to mature, integration with EMRs will become easier and more streamlined. Digital image files are stored in a standard file structure, called DICOM. Integration with HL7 files requires a broker or bridge.

Image sharing. With digital technology, images can be transmitted over a VPN to a radiologist for over-reading, which is much quicker and easier than sending films by courier. Most digital viewing systems include the capability to burning a CD with a DICOM viewer embedded. Referral images thus can be created easily and viewed and manipulated on most standard PCs.

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| Cost of Ownership for X-Ray Imaging: Digital vs Analog in an Urgent Care Start-Up Setting | | |
|---|-----------------------|----------------------|
| Exams: 2,290 | | |
| | \$/Study | |
| | CR Filmless Operation | Film-Based Operation |
| Material | — | 3.67 |
| Facilities | 5.82 | 9.76 |
| Equipment | 5.38 | 2.89 |
| Resources | — | — |
| Total | 11.21 | 16.32 |
| Savings | (5.11) | |
| Images: 6,424 | | |
| | \$/Image | |
| | CR Filmless Operation | Film-Based Operation |
| Material | — | 1.67 |
| Facilities | 2.65 | 4.44 |
| Equipment | 2.45 | 1.31 |
| Resources | — | — |
| Total | 5.09 | 7.42 |
| Savings | (2.32) | |
| Annual Expense | | |
| | CR Filmless Operation | Film-Based Operation |
| Material | — | 10,712 |
| Facilities | 17,000 | 28,500 |
| Equipment | 15,720 | 8,440 |
| Total | 32,720 | 47,652 |
| Annual Savings | 14,932.02 | — |

The summary sheet shows the entire cost of ownership for both digital and analog imaging in a sample start-up urgent care practice. The difference in annual costs is shown in red. The assumptions underlying the calculations are as follows:

- *Site information:* Daily procedures assume eight studies per day, 7 days per week. Total printed images include retakes, lost films, multiple views, etc.
- *Material:* This is the cost for consumables such as film, chemistry, filing jackets, and utilities. Film pricing is at current cost. Speculation in the industry is widespread that film and chemistry costs are going to rise significantly based on supply and demand.
- *Facility cost:* This is the cost of space for the imaging area. An x-ray unit is required for a digital or analog set-up. With digital technology, however, neither a darkroom area—which typically measures 6' x 8'—nor film storage space (usually 6' x 12')—is required.
- *Equipment cost:* This is based on an average single-plate CR reader and x-ray system for a digital configuration versus a table-top processor, darkroom accessories, and x-ray system for an analog version.
- *Maintenance cost:* This includes a monthly fee for processor maintenance for an analog system, and the service contract on a CR system for digital technology.

Conclusion

Urgent care clinics just starting up or looking to add imaging to their practices should weigh the pros and cons of offering digital versus conventional x-rays.

Understanding the differences between the two technologies and assessing the true cost of ownership are the keys to an educated decision. ■