

ShadowCounsel Healthcare Imaging Primer

At the outset of a given healthcare related digital imaging project, it's crucial that ShadowCounsel gain a clear sense concerning, 1) your input – in other words, what is the source material you wish to be digitized, 2) what you intend to use ShadowCounsel's work for, precisely, 3) the image file format output you want, and finally, 4) the software or application with which you wish to view and navigate your digital images.

With respect to digital image file format outputs, **DICOM** (Digital Imaging and Communications in Medicine) is the medical image standard. It requires special DICOM reading and viewing software. This technology is used by hospitals and medical facilities in their PACS (Picture Archiving and Communication System) workstations and occasionally by legal experts who use personal medical computers and software in healthcare related cases. **TIFF** (Tagged Image File Format) is the recommend for the storage and use of digitized medical film for litigation support, in that images in such format can be opened and closed without loss of bits of information and easily transferred to popular litigation presentation software programs. However, tiff files are large and eat up computer memory, and take some time to open. Moreover, only 15 to 40 x-ray images in tiff format will fit on a CD-ROM. **JPEG** (Joint Photographic Experts Group) will also work for storage and use in litigation support. Unlike the tiff format, jpeg image files can be compressed from roughly 50% to as low as 2% of the original file size. This kind of compression comes at a price. JPEG images are characterized by a form of 'lossy compression' with some information from the original image discarded and lost forever in the compression. **PDF** (Portable Document Format) is the most universally viewable and versatile image file format. This image format transmits quicker than tiffs or jpegs, and is suitable for use in association with Microsoft Powerpoint presentation software.

Digitized medical images can be burned to CR-ROMs and DVDs. Furthermore, they can be conveniently be viewed and navigated via computers, displayed and annotated, printed, and transmitted via e-mail.

Digital images are best viewed using quality photo digital software (PhotoShop, PhotoImpact or PaintShop Pro). Microsoft Windows will read tiff, jpeg and pdf image file formats as well, Although the image quality is not quite as good. One of the errors often made by people viewing medical digital images is to use standard desktop, laptop or notebook monitors with limited calibration, contrast ratio, and luminance. Moreover, computer monitors currently cannot display more than 8 bits of grayscale. A 17" or larger LCD monitor with a resolution of 1280 x 1024 or higher and a contrast ratio 350:1 or higher will display complex graphics and high definition images, though ideally one would want to use medical quality monitors with resolution of up to 2000 x 2500.

With respect to quality, it is important to remember that the better the source medical film, the better the resulting digital image will be. If one starts with poor quality film, the finished digital product certainly won't be any better.

ShadowCounsel uses a VIDAR DiagnosticPro Advantage medical film scanner, which can scan at incredible 32-bit mapped to 12-bit or 8-bit grayscale outputs, depending on the application. This technology exceeds the American College of Radiology standards governing minimum resolution for medical diagnostic uses.