Digital Cameras vs. Intraoral Cameras: Does the modern practice need both?

Christopher Weed
Vice President, Cygnus Technologies

Ralph Green, DDS, MBA
Executive Vice President, Cygnus Technologies

As a manufacturer of both intraoral cameras and digital camera systems, we are often asked by dentists which of these imaging technologies is best for their office. There is some overlap in the capabilities of intraoral cameras and digital cameras, but the well-equipped digital office will likely need both in order to fully meet their needs. Let’s examine why this is the case based on an analysis of the strengths and weaknesses of each type of camera.

Intraoral Cameras

Intraoral cameras have been around for nearly 20 years, and there are several dozen models on the market that span a wide range of prices and features. The word “digital” should be clarified as a start to our discussion. Despite advertising claims by some manufacturers that their intraoral cameras are digital, all intraoral cameras presently sold today are in fact analog devices. By definition, an intraoral video camera using a CCD (charged coupled device) imaging device is an analog product. In most cases, digital is used as a shorthand way of indicating that the intraoral camera may be used with a computer. In fact, any intraoral camera may be used with a computer if you have the right video card and software. We’ll be using the term digital in this article to describe a handheld digital still camera, and the term intraoral camera will describe the traditionally-used intraoral video camera.

Because intraoral cameras are video devices, they have several desirable features. First is the ability to display a live image on the screen that can be manipulated and viewed from many angles simply by moving the handpiece around in the mouth. This differs from a digital camera where the image is a still image. The images are instant because the camera is connected to the TV or computer for live viewing. In most practices, viewing an image is as simple as picking up the camera and turning on the TV or computer. Video also allows for recording of a whole mouth tour for playback at a later date. And, because the intraoral camera is a video device, no computer is needed—just a standard television set.

Intraoral cameras by the nature of their design are also easily navigated into small areas in the back of the mouth for viewing of margins, for example, or another area of concern. Most models allow you to view an area such as a single tooth very close-up with high magnification. They excel when viewing buccal surfaces in nearly any area of the mouth. All models have some sort of an integral light source, so no external lighting is required to obtain an image. This is particularly helpful for detecting subsurface fractures and cavities due to the close-up view and integrated illumination.

There are also several downsides to using an intraoral camera. The intraoral camera is a video device, and was conceived to show live images on a screen. Thus, when frozen using the camera, software, or video printer, the image quality is often inadequate to show the level of detail many users would prefer. Some users find intraoral cameras and all the associated paraphernalia to be cumbersome, especially those users who wheel around the older cart-based systems. And, when it comes to providing the high-quality images required for many cosmetic imaging packages, most intraoral camera images are simply inadequate unless you have a top-of-the-line camera paired with top-of-the-line video cards and other components.

And, one more caution…don’t let an aggressive sales rep convince you that only a certain brand of intraoral camera is compatible with your software. Any intraoral camera, no matter how old, is compatible with any imaging software with a video module provided you install a video capture card compatible with the software. Consult your software company for a list of cards compatible with your software package.

Digital Cameras

There are a number of mass-market consumer manufacturers offering digital cameras including Olympus, Sony, Nikon, Minolta, and many others. Depending on the features and number of pixels desired, pricing ranges from about $200 up to over $2,000 for the latest professional models. For most dentists, a model in the 3-4 million pixel range should be sufficient unless you are producing images larger than 8 x 10 inches. Regrettably, many dentists have less then stellar results

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from the purchase of a standard digital camera from their local electronics store. This is because the combination of lenses, lighting, and camera settings required for a high quality intraoral image is more complicated than most novice photographers can reasonably figure out. Thus, several manufacturers, including Cygnus Technologies, PhotoMed International, and Lester Dine have introduced kits that include the camera along with accessories such as macro lenses, software, etc. that allow the dentist to easily obtain a high quality intraoral image. And, in the case of these three companies, the kits are very competitively priced versus major retail chains when you consider the value of all the accessories and the professional support provided.

Recent discussion on the DentalTown.com message boards indicates many users have bought a digital camera at their local store and then invested untold hours in trying to figure out how to use it for dental use. Odds are that without the correct accessories and training, you will never achieve optimal results. By the time all is said and done, you’ll save time, money, and frustration by purchasing a kit designed for dental use. All the homework is already done for you.

Most models of digital cameras have a display on the camera body that allows for easy viewing and framing of the image before it is taken. With just a few minutes practice, even novice users can generally take a good quality smile, arch, or full-face image. More complicated images involving mirrors or close-ups may require a little more practice but are generally within the realm of most users.

Images are crisp, clear, and have amazing clarity. Reproduction using nearly any good quality computer photo printer is excellent. To view images, most models use either a USB cable that plugs directly into your PC or utilize a memory card that is slipped into a reader à la floppy diskette. Image quality is more than adequate for cosmetic imaging manipulation, before-and-after shots, and record keeping. There are trade-offs versus intraoral cameras, and they can be substantial depending on your priorities. The biggest trade off is speed. If you have a patient in the chair with a cracked tooth or a bad amalgam, for example, it’s easy to pick up the intraoral camera and show the patient the concern on the TV or computer. It’s very fast and very simple. On the other hand, a digital camera requires you to take the picture, hook the camera up to the computer, launch the software, retrieve the image, and then display it. This process can take a few minutes even after you have become familiar with the steps involved. And, in many of the older dental software packages, this can be a laborious process because the software was designed before digital cameras even existed. A software package that previews the images before you import them is a necessity. This saves tremendous time and frustration. If your software lacks a preview function, you must determine, for example, whether file 132426A.jpg or 627289B.jpg is the file you wanted from the list of undecipherable files on the camera’s memory card. If your priority is to quickly show the patient a cracked amalgam, for example, and then get on with the task of fixing it, then an intraoral camera would be a better choice.

Another major shortcoming is the ability to take certain types of images. No matter how good your skills with the camera, smiles, full faces, and arches are the most common and easiest image types to obtain with a digital camera. The areas where the intraoral camera is strongest are coincidentally the same areas where a digital camera is weakest. Obtaining the buccal view of a rear molar or a close-up of a bad amalgam, for example, are areas where a digital camera might not do the job you want. You can make the job easier with mirrors, retractors, and creative angles, but the fact remains that you cannot put a digital camera into the patient’s mouth like an intraoral camera.

The Bottom Line

As stated above, both types of cameras have their place in today’s well-equipped office. If your priority is speed and ease-of-use, then an intraoral camera is a better choice. If you desire the highest quality images, and you do a lot of cosmetic or orthodontic work, then a digital camera is the better choice.

Ralph Green, DDS, MBA Executive Vice President

Dr. Green is a former Professor of Tufts University School of Dental Medicine and has been involved in numerous technological startups. He was previously President of Zila Biomedical and VP/GM of Zila Professional Pharmaceuticals. His dental background, combined with his business acumen, has been in the development of dental implants, lasers, optics, tissue engineering and dental materials. Dr. Green can be contacted at 1-800-626-2664.

Christopher Weed

Christopher Weed is Vice President of Marketing at Cygnus Technologies in Scottsdale, Arizona. He has assisted thousands of dentists with the set-up, training, and installation of dental digital imaging systems including intraoral cameras, digital cameras, and digital radiography systems. Christopher holds degrees from Central Michigan University and The American Graduate School of International Management. Chris can be contacted at 1-800-626-2664.