

Picture-perfect digital images

More GPs are “zooming” in on digital cameras to obtain quality images for patient education and other clinical situations, from diagnosis to photo-documentation. Here’s a guide to choosing digital cameras that work for the dental office.

By Dr. Larry Emmott



DR. LARRY EMMOTT

The digital camera revolution is no longer coming; it has arrived. Forty-seven percent of dentists now own digital cameras, and 13% plan to buy them within the next 12 months, according to an Equipment Survey sent to GPs last September by *Dental Products Report*.¹ That could mean that as many as 60% of dentists could be invested in the digital-camera revolution by year-end (see “Digital cameras ‘click’ with GPs” chart, on page 53).

Compare this with a May 2000 DPR Equipment Survey that showed only 12% of dentists using digital cameras.²

Trends and benefits

So why are digital cameras catching on at such a remarkable rate?

One reason is that digital cameras are powerful visual tools for patient education, cosmetic-case presentations, and diagnosis. These three clinical situations rank as the top uses for which GPs who own digital cameras said they use the cameras, according to DPR’s August 2003 Clinical Photography Survey³ (see “How you’re using digital cameras” chart, on page 53).

Another reason behind the popularity of digital cameras is that new digital technology is making the cameras easier, faster, cheaper, and even more effective than before.



“Our dental-camera sales have shifted almost entirely to digital,” said Mike McKenna, vice president of PhotoMed International. “Polaroid and 35mm film cameras still have a place in clinical photography, but the flexibility of digital imaging makes it hard to justify buying film and waiting for it to be processed.”

“The changeover from film to digital cameras can be described as nothing short of revolutionary, and it will continue to grow,” said Matt Dine, vice president and director of digital camera sales at Lester A. Dine Inc. “Not only has the once-robust film-based camera market disappeared, but the interest in digital photography couldn’t be greater.”

“A digital camera is convenient, a timesaver, and a money-saver,” said Fred Friedman, president of CliniPix Inc. “The doctor no longer has to buy film, develop it, or wait a week to see the results. For example, with a digital camera, a doctor can ‘stay’ on a Preview screen until he get the results he wants.”

Now may be the time to join the digital camera revolution. To get started, you need to begin capturing or creating images, and for this you need a digital camera. As you begin your digital camera search, here are some elements to look for, some pitfalls to avoid, and some resources to check out.

Digital camera essentials

Consider the following elements when buying a digital camera:

1. Macro focus. The camera should be able to take a picture—in focus and without distortion—of both a full-face smile and a close-up smile. Most inexpensive point-and-shoot cameras can’t do these close-up pictures well. Most standard cameras have a limited, or fixed, focal length, and they are designed to take a photo from at least 6 feet away.

In the dental office, we need to be much closer. We need a digital camera with “macro” focus capability, which allows us to focus on a small field or area. A camera can use a built-in lens, a separate interchangeable lens, or both, to achieve macro focus.

2. Image size. The next factor to consider is image size, quality, or resolution. Image resolution is most often stated in terms of *pixels*. A pixel, which is short for “picture element,” is a dot of color on a screen. The more pixels an image contains, the greater the image detail or resolution.

One million pixels equals 1 megapixel. If your camera creates an image that is 3072 pixels in width and 2048 pixels in height, it has a resolution of 6.3 megapixels. (Multiply 3072 by 2048 pixels, and you get 6.3 million pixels.)

On the other hand, if the image is that big, you will never be able to see all of it at actual size on a monitor. In other words, when you open the full-size image, at 100% magnification, you only will see a small portion on the screen. At the present time, computer monitors

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Building a high-tech office:

A 10-article series

How do you build a high-tech office? To find out, we asked Dr. Larry Emmott, DPR’s technology editor, to present a 10-article series to guide you through the complex process of choosing and using high-tech systems, from software and hardware (see Feb., March, April, and May issues, to digital cameras (this issue), as follows:

- **Management software:** charting (February), scheduling (March), and finances (April)
- **Hardware in the operator** (May)
- **Digital photography (June)**
- **Q&A on building a digital practice** (July)
- **Digital marketing** (August)
- **High-tech diagnostic devices** (September)
- **Online consultations** (October)
- **Digital intraoral cameras** (November)

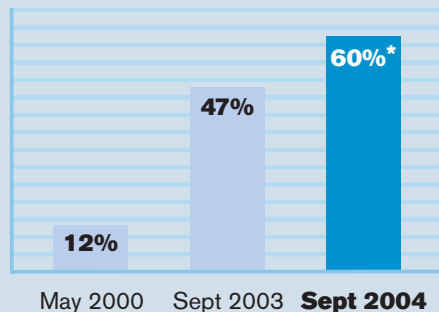
This month, Dr. Emmott focuses on the rising use of digital cameras in dentistry and highlights some key aspects to consider when checking out digital cameras, including macro focus, image size (in pixels), and megapixel range. He also includes resources where you can find out more about camera kits and companies.



Digital cameras 'click' with GPs

The percentage of dentists using digital cameras is on the rise and could hit 60% of dentists by September, according to DPR surveys, as follows:

Digital camera ownership (%)



**Projected total, representing the percentage of GPs who currently own digital cameras (47%), plus the percentage of GPs who plan to purchase in next 12 months (13%)*

Sources: September 2003 Dental Products Report Equipment Survey, May 2000 Dental Products Report Equipment Survey

How you're using digital cameras

GPs are using digital cameras for a variety of clinical situations, according to an August 2003 *Dental Products Report* survey.

For which clinical situations do you use digital cameras?

CLINICAL SITUATION	% USING
Patient education	100%
Cosmetic case presentations	97%
Diagnostic aid (e.g., to view cracked teeth, etc.)	96%
Photo-documentation for insurance/claims submission	95%
Photo-documentation for patient records	95%
Laboratory communications	90%
Photo-documentation for legal/liability protection	89%
Restorative-case presentations	89%
Consultations with colleagues	86%
Treatment planning (e.g., materials selection, scope of treatment)	84%
Marketing	76%
Self-evaluations and improvement of dental skills	71%
Oral cancer screening, diagnosis, and case acceptance	69%
Pathology aid (e.g., identify various intraoral lesions, growths, etc.)	67%
Pictures of new patients	67%
Lectures	35%
Other*	71%

** e.g., To document each stage of orthodontic treatment; to chart tooth-whitening.*

Source: August 2003 Dental Products Report Clinical Photography Survey

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only can display between 0.5 megapixels (800x600 pixels) to 2 megapixels (1600x1200 pixels) on screen.

An image larger than the monitor can display is wasted when viewing on screen. Plus, very large images occupy excess storage space and take a long time to process.

Often, images as small as 640x512 pixels or about 330,000 pixels (about 0.3 megapixels), are adequate for screen display.

The only time a higher resolution image may be useful is if a user wants to zoom in from a full arch to a single tooth. Or, the user might be doing cosmetic imaging, for which larger, high-resolution images are better, as

they provide maximum detail and color information. High-resolution images make cosmetic simulations easier to create and appear more natural and attractive.

However, don't feel you must get the highest resolution camera available. There is no clinical value in taking extremely high-resolution images. Choose a mid-

**Easy Dental
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Camera resources: 14 companies to contact

To find out more about digital cameras, kits, and accessories, check out the product offering of the companies listed alphabetically below. You can contact the companies directly or check out their product offerings on **www.dentalproducts.net**.

Calumet Photographic-USA

800-CALUMET (800-225-8638)
www.calumetphoto.com

CliniPix Inc.

866-254-6749
www.clinipix-on-line.com

Cygnus Technologies, a Progeny Dental Co.

800-626-2664
www.cygnus-technologies.com

DADS Photography

210-872-8194
www.dadsphotography.com

Dental Learning Centers

425-557-7788
www.dlcenters.com

Eastman Kodak Co.

800-933-8031
www.kodak.com/go/dental

Fuji Photo Film Co. Ltd.

800-755-3854
www.fujifilm.com

Lester A Dine Inc.

800-624-9103
www.dinecorp.com

Masel

800-423-8227
www.maselortho.com

Norman Camera

800-900-6676
www.normancamera.com

Ortho-byte.com

302-761-9877
www.ortho-byte.com

PhotoMed Intl.

800-998-7765
www.photomed.net

SciCan Inc.

800-572-1211
www.scican.com

Washington Scientific Camera Co.

253-863-2854
wsccrz@aol.com

level camera with a resolution in the 4-to-7-megapixel range.

Then, when you take a picture, set the camera for an image size (in pixels) that's most appropriate for its use. Use a small image size (i.e., 1600x1200 pixels) for on-screen displays, e-mail attachments, and small prints, and for an orthodontic series. Use a large image size (i.e., 3072x2048 pixels) for high-zoom magnification, cosmetic simulations, and large prints.

3. Special flash. The camera needs a remote ring flash or a flash diffuser to distribute the light evenly.

Standard built-in flash systems on most cameras often will wash out close-up smile photos. The built-in flash also will create deep shadows on one side of the photo and bright highlights on the other, thus obscuring detail and making cosmetic imaging difficult.

"A ring flash also is ideal for deep posterior intraoral photography," Dine said. "Over-the-counter cameras just can't provide the complete, consistent illumination so important to intraoral photography."

4. Accessories. Needed accessories include lenses, lens adaptors, a remote ring flash or diffuser, memory media, a media reader, batteries, possibly a battery charger, and most importantly, instructions.

Camera buying pitfalls

Finding the right camera and putting all the accessories together can be an expensive, time-consuming process. And it's easy to make a mistake.

Here are some pitfalls:

- "The biggest mistake doctors make is going to a large electronics store and buying the latest, greatest recreational digital camera and assuming that it will take good clinical photographs," McKenna said. "Unfortunately, off-the-shelf digital cameras will not take the same quality dental photos that you can take with typical 35mm dental digital camera systems."

"A retail camera store doesn't know what's best for dental applications," Friedman said. "For example, they don't know how to use a camera with a mirror in a patient's mouth."

- Another major mistake doctors make is buying digital cameras that require using "digital zoom" to take close-up photos.

Digital zoom magnifies an image by cropping the shot to include only the areas you have zoomed into and magnifying the pixels in those areas.

Digital zoom makes you think that you actually have zoomed in further than the lens is capable of zooming. In actuality, it is

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DR. EMMOTT'S

Digital camera handout

Dr. Larry Emmott has prepared a "Digital Camera Update" handout for attendees at his lectures on high-tech dentistry. The handout features dental digital camera kits from Eastman Kodak Co., Norman Camera, and PhotoMed International. To obtain a copy of this handout, e-mail Dr. Emmott at larryemmott@drlarryemmott.com, or access his Web site: www.drlarryemmott.com.

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Patient News jr 1/4 v

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only a software manipulation of the image. The result may be a decrease in the printed image's quality. With a 2X digital zoom, you can lose 75% of the image resolution, and your photo quality suffers. Rather than digital zoom, look to cameras that use quality lenses to achieve macro focus.

Camera buying resources

Several companies offer complete digital camera kits, optimized for the dental office. For information on these and other digital camera resources, see the following:

- "Camera resources: 14 companies to contact" (sidebar, on page 54)
- "Dr. Emmott's digital camera hand-

out" (box, on page 55)

- "What's online— "3 articles on digital camera kits"; "2 articles on digital imaging software" (box, below). You also can find these articles on our Web site, www.dentalproducts.net

The digital-image revolution is no longer coming. It has arrived, and it is changing

dentistry in many ways. What's next? I don't know, but I do know that the future is coming and it will be amazing! **DPR**

Dr. Larry Emmott, a recognized authority on dental technology in America, is a practicing general dentist in Phoenix. He also is a professional speaker, a featured instructor at the Las Vegas Institute, and a member of the American Academy of Dental Practice Administration. He has written hundreds of articles on dentistry, computer use, and management. He also writes a monthly electronic newsletter, "Emmott on Technology." Dr. Emmott also offers hands-on technology seminars in the Phoenix area. For more information, call Dr. Emmott at 602-279-1641 or visit www.drlarryemmott.com.

References

1. A Dental Equipment Survey was issued by *Dental Products Report* in Sept. 2003 to 2,000 U.S. GPs.
2. A Dental Equipment Survey was issued by *Dental Products Report* in May 2000 to 2,000 U.S. GPs.
3. A Clinical Photography was issued by *Dental Products Report* in August 2003 to 2,000 U.S. GPs.

Photo credit

- Photos of Canon cameras on page 52 and 53, courtesy of PhotoMed International.

Air Techniques
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What's online

3 articles on digital camera kits

How do the latest dental digital cameras work? Check out these articles on our Web site, www.dentalproducts.net:

1. **Canon Digital Rebel**
from PhotoMed Intl.
2. **Digital SLR Systems**
from Lester A. Dine Inc.
3. **Kodak DX4900
Dental Digital Camera Kit**
from Eastman Kodak Co.

To find the articles, go to our home page, slide your cursor over the **DPR@ctive tab**, and use the drop-down menu to select "Extra." Then under, "Posted June 2004," click on "Applying New Technologies – 3 articles on digital camera kits."

2 articles on digital imaging

Looking for tips on digital imaging? See Dr. Larry Emmott's articles:

1. "A guide to managing digital images in dentistry"
2. "Digital cosmetic imaging: Tips and tools to keep you and your patients smiling"

On our home page, go to the **DPR@ctive tab**, and click on "Consult the Experts." You'll find the above articles listed under, "Emmott on Technology – 2002."

