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Digital Photography and Imaging for the Cosmetic Dermatologist: Image Editing and Archiving Software - Part II

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This is the second installment of a two-part series. Part I was published in January.

To successfully incorporate digital photography into a cosmetic dermatology practice, clinicians need to develop an understanding of several technologies. In part I of this two-part series (*Cosmetic Dermatology,* 14:21–24), I discussed digital cameras, lenses, and flashes. But having the correct camera, lens, and flash is only the first half of the equation. The second half—image editing and archiving software—is where the more significant advantages of digital photography become apparent. This article, part II of the series, addresses the important software involved.

DIGITAL IMAGING SOFTWARE

Imaging software varies from free shareware to $20,000 programs. But, one does not need to spend a lot of money to get adequate imaging software. Several companies sell powerful imaging software at reasonable prices.

Ask the average cosmetic surgeon why he or she wants digital imaging, and you are likely to hear about all sorts of gadgetry and features like *morphing.* Many doctors purchase imaging systems for the wrong reasons. Don't misunderstand me, there is certainly a place for morphing and other "bells and whistles" in a practice, but a few features are far more critical for the average cosmetic surgeon. When evaluating imaging software, you should pay close attention to the features that you will use 99% of the time and less attention to the features that you will use 1% of the time. Here are some of the most important features to consider:

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Price. The adage "you get what you pay for" does not always apply in the high-tech arena. As a technology matures, its cost usually decreases. A few thousand dollars should be enough to purchase powerful imaging software, including support.

Archiving. This is perhaps the most critical aspect of digital imaging. Those of us who not so long ago relied on traditional (e.g., Kodak) slides can remember the frustration of frantically looking for "that one slide that you know you have" the night before a big presentation. Digital images are of no use if you cannot find them with the click of a mouse. Advanced imaging software allows easy archiving and retrieval of images along with the ability to enter the images into a database for multi-parameter searches. If you input details or keywords associated with each image, then it should take only a few seconds to search your computer for, say, all Asian females who underwent liposuction between two dates, who had a specific complication, and who live in an area with a specified postal code. Simply enter the keywords, and the computer can find the images of all those patients in a matter of seconds. Of course, most clinicians choose to forgo entering keywords for each image due to time constraints, but certainly the benefits of being able to search for specific data are clear, and many clinicians routinely search for patients' names and specific procedures and thus generate informative lists. In the past, an archiving application was considered powerful if it showed the names of image files stored in different directories. That standard has been raised, naturally, and so now the new basic requirement is that the software allow all images in all directories to be displayed as small pictures ("thumbnails") for easy viewing. Being able to see thumbnails as opposed to mere file names is a huge advantage.

Image editor. The image editor is the software component that allows "postprocessing" of digital images—the ability to alter images in innumerable ways and the true advantage of digital photography. In the past, clinicians had to settle for slides and, frequently, their superfluous backgrounds, poor color, poor exposure, and tilted im-

Fig. 1: Morphing is one imaging feature that can help the clinician with preoperative marketing and planning. It is paramount not to mislead a patient with promised or implied results.

ages. In addition, making before-and-after pictures and adding text to image slides were difficult. Image editors allow clinicians to have total control over their images. Making before-and-after pictures takes only a few mouse clicks, and little effort is needed to change brightness, contrast, hue, saturation, or backgrounds; add special effects and text; or straighten images. The ability to make changes so easily raises a concern about image forgery. True medical records should be unalterable. Fortunately, standards for medical photography are being established. For example, the DICOM (Digital Imaging and Communications in Medicine) standard is being adopted by many organizations. DICOM will allow all types of image devices and software to communicate with one another and will provide reams of the patient- and doctor-related information that is encoded in the images.

Presentation software. Again, images are of little use to the clinician if they cannot be made to "work" for the practice. Advanced imaging systems offer presentation programs that can be used to create personalized, multimedia slide shows of images. These shows can be used for case presentations, patient education, informed consent, and marketing. Processing and compressing images for e-mail or Internet posting are also factors to consider when evaluating imaging software. This software should also allow images to be dragged and dropped into PowerPoint shows and word processing documents. Adding images to correspondence and stationery truly represents a commitment to technology and is a simple task.

Morphing software. Morphing can be a very useful application for a clinician's practice. In my 10 years of experience with the digital imaging industry, I have seen doctors get very excited about morphing—sometimes to the point that they ignore other important aspects of the system. Also, as the adage goes, "when you get a

new hammer, the whole world looks like a nail!" With regard to imaging, this means that doctors new to imaging systems begin morphing almost all their patients because it is fun and novel! As the days pass, they lose interest in morphing everyone and start using the morphing application on select cases or at a patient's request. Niamtu's law of morphing is, "Never let your mouse write a check that your scalpel can't cash." I am aware of at least one malpractice case in which a patient took morphed images to represent promised surgical results. It's better for the clinician to err on the conservative side with morphing and to issue disclaimers that morphed images do not guarantee surgical results. I find morphing useful in facial profile surgical predictions (e.g., nose, chin, malar, and submental surgical predictions), not only to provide patients with information but to plan treatment (Fig. 1). The results of almost any procedure can be morphed, but the process can be time-consuming. A much more beneficial means of keeping patients informed about and satisfied with their treatment is to show them a computer slide show of multiple preoperative, and postoperative images for a specific procedure. Not only does this give patients an idea of what to expect, but, at the end, it also underlines the cosmetic surgeon's skills.

DIGITAL IMAGING COMPUTERS

There is no doubt that clinicians should get the most advanced computer they can afford. Digital images are memory hogs, and, although older, slower computers can technically be used, lost time greatly offsets any potential savings. As resolution increases, so does the need for speed and storage. Large images bog down operating systems and consume storage space. I recommend, as absolute minimums, a Pentium 500-MHz processor, 125 megabytes (MB) of random access memory (250 MB is better), and a 10-gigabyte (GB) hard drive. I am a huge advocate of portability, efficiency, and convenience and thus recommend storing
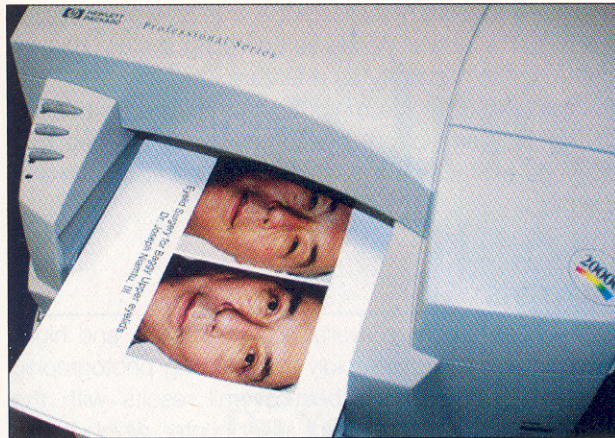
Fig. 2: a. The Hewlett–Packard 2000C is one of the newer photographic-quality inkjet printers that is fast, quiet, accurate, and affordable.

Fig 2: b. Clinicians can use imaging software to make before-and-after images for marketing and patient education. Note the slide shows on the computer monitors—a very effective means of using images for marketing.

and processing all digital images on a single notebook computer. Clinicians can take a notebook computer on the road—to the main office, to satellite offices, to the hospital, to meetings, to conventions. And storing everything on one computer can help a clinician avoid the pitfalls common to setups involving multiple systems—lack of coordination, confusion, and files being stored on one system but not on the one being used! "One computer, many pictures" is one of my mottos. Last, being able to

leave eight carousels of slides at home and take along a single CD is very convenient.

BACKUP STRATEGIES

As it takes many years to amass and organize a large collection of slides—traditional or digital—losing such a collection would be devastating to a clinician. With

digital slides, clinicians must always keep in mind that they could lose all their work from a computer virus or malfunction in a matter of seconds. The "Love Bug" virus that swept the world in May 2000 is a good example. Attached to an e-mail message, this virus, when activated, searched a person's entire hard drive for JPEG image files and corrupted them. I myself lost several thousand images; fortunately, I had backed them up the week before. Still, I lost the images that I had not backed up. Some of these—from the operating room and of unique pathology—I can probably never replace. Thousands of computer users without any backup strategy lost everything. Obviously, making regular backups is the key to protection and peace of mind. I try to remember to start a backup before going to bed each night; when I wake up, the job is done.

Image files can be backed up in various ways—onto everything from floppy disks to storage media of much larger capacity. I prefer backing up my notebook computer's files onto a removable CD drive; a single disc holds 700 MB of data, and the CD is an extremely stable medium. As backups should also be done while on the road, portability is paramount too. I have about 5000 images on my computer; backup requires two CDs. Recordable DVD units are available but are very pricey now. As this technology improves and becomes more affordable, it will enter the mainstream market. A single DVD disc holds 7 GB of data.

Zip drives are also very popular for backups. One advantage is their small size, which allows for great portability. The medium is not as stable and resistant as CDs but has become popular nevertheless.

Another acceptable backup strategy is computer-to-computer data transfer. Clinicians can use a program (e.g., pcAnywhere™) to copy images, say, from an office computer to a home computer via telephone modem. The problem with this type of transfer is usually slow speed. As faster services (e.g., cable modem, DSL, ISDN) become more popular, this option will become more appealing. Another advantage of this "remote-control" software is that it allows a user to access data stored at a remote location. Once, in Phoenix, Arizona, the day before I was to give a lecture, I realized I had forgotten one of my face-peel presentations at my office in Richmond, Virginia. Fortunately, from the hotel, I was able to use pcAnywhere to copy the lecture material from my office computer to my notebook computer.

That was the day I realized the true power of digital imaging. The newer Windows operating system has remote-access capability as a feature.

Again, whatever the method, data should be backed up regularly and often, because it's a guarantee that everyone will face data loss or corruption at one time or another.

PRINTERS

New printers become available each month, and high-grade color printing is rapidly approaching photographic quality. I have had the best overall results with the Hewlett–Packard 970cxi color inkjet printer, which is fast and quiet and produces vivid results. I use glossy paper of the highest grade. I always print before-and-after images of my major cases and give several copies to the patient and one to the referring doctor; with the patient's approval, I also frame one for marketing within the office. Again, making images work for one's practice is the goal (Fig. 2).

CONCLUSION

We are living in an era in which digital photography is replacing conventional film photography. As with any paradigm shift, the rules change rapidly, but there is absolutely no doubt that this technology is here to stay. The hardware and software are affordable for the average clinician. By investing some time in learning about digital photography, clinicians can make a significant positive impact on their practice.

PS: The best doctors take many pictures!

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