First things first:
5 steps to a dream digital dental office

By Dr. Larry Emmott

Dentistry, like the rest of the world, is being propelled headlong into an electronic, paperless, digital future, but not without bumps in the road. In this guide, you'll find five steps to help you develop a digital office, as follows:

1. Establish a technology infrastructure.
2. Consider the Big 2: digital images/ digital radiography.
3. Add advanced dental applications.
4. Keep non-dental programs in mind.
5. Be open to evolving technologies.

Plus, you'll find updates on practice management and image management software, digital radiography, diagnostic devices, and more.

The purpose here is not to recommend any specific system as *your* solution. Rather, this overview will help you understand the importance and value of digital systems working together successfully.

By Dr. Larry Emmott

Where do you begin to develop your ideal, high-tech dental office? It seems obvious that you start with the **first things first**.

This basic premise is so important that Stephen Covey, author of *Seven Habits of Highly Effective People*, identified it as Habit No. 3, stating: "It's all about learning to prioritize so that your first things come first, not last." Covey thought this habit so important that he wrote another entire book entitled, *First Things First*.

Covey also wrote that you should, **"Begin with the end in mind."** In other words, know where you are going before you start; develop a vision first. For dentists, a vision of their ideal high-tech dental office ought to include the type of office they want, the kind of dentistry they want to do, how they will relate to patients, and how they will manage the office. Then, dentists can envision the types of technology they want to support their dream office,

Thus, your ideal high-tech office of the future starts, not with technology, but rather with a vision of the type of dentistry you want to do. Once the vision is in place, here are the five steps to

Continued on page 42

Digital technology is reconfiguring the dental office. Here's a look at what various digital tools can do.

Practice management software: Integrated software transfers data, such as charts, from clinical to administrative areas, prepares pending treatment reports, sends referrals via the Web, and performs many other management tasks. (See page 42.)

Non-dental application: Useful applications include financial programs that track payables and compile accounting reports. (See page 131.)

Image management: Image management software captures, stores, and displays images; in turn, screen shots are used for reports. (See page 43.)

Diagnostic devices: New devices, such as this 3-D jaw tracking system, use computers to enhance dentists' ability to find and treat dental disease. (See page 46.)

Digital radiography: Digital x-ray images acquired via sensors can be stored in a digital record, enhanced for better diagnosis, and sent electronically. (See page 44.)

Education and case-presentation tools: Patient education programs use slides, full-motion video, and sound to present patients with treatment options. (See page 46.)

EMMOTT UPDATES

Practice management software

Practice management software, the cornerstone for building a high-tech office, must be complete and integrated. In other words, each element of a program must be able to communicate with the others. The chart needs to talk to the schedule, the schedule needs to talk to the ledger, the ledger needs to talk to the treatment plan, and so on.

Some dentists feel they won't use a complete system and that it would be smarter to move into technology slowly by adding one software element at a time. This approach may seem prudent, but usually it is a big mistake.

For example, suppose the office first installs a billing system. Then, later, it adds a stand-alone scheduler. Then, later still, it adds a separate charting program. The result is that the billing, scheduler, and charting software won't be integrated. The office staff still will be stuck entering data multiple times, a chore that takes time and tends not to get done. In addition, it will be hard or impossible to relate important data from one program to the other.

Here's another example. Many dental software programs can generate a pending treatment report, which is a list of pending treatments for a particular patient. To be really useful, the report should include all diagnosed treatment for which the patient has not yet been scheduled. The computer also could check for unused insurance benefits. It could then present the list of unscheduled pending treatments in order of urgency or size of case. The report could also include a telephone number where the patient could be reached. This one report, designed to re-activate patients and help them get scheduled for needed treatment, usually will pay for the investment in technology.

However, to create that report, the computer must have access to the treatment plan to see what has been diagnosed. The computer must then check the electronic schedule to see if the patient has an appointment. It must then check the financial information to see if there are any unused insurance benefits. Then, the computer must rank the list by amount of treatment and add a phone number from the family information. If the software isn't complete and fully integrated, a complete pending treatment report can't be done.

Continued from page 40

take to help make your dream digital dental office come true.

1. Establish a technology infrastructure

There are two elements to the technology infrastructure.

The first step in building the infrastructure must be to install and use a practice management software system that is sound, complete, and integrated.

Comprehensive software packages are available from companies such as PracticeWorks Inc.; EagleSoft, a Patterson Dental Supply company; Dentrix Dental Systems Inc., a Henry Schein Inc. company; and Dental.com. For a list of phone numbers and Web sites for these four companies and other manufacturers mentioned in this article, see the "Technology connections," sidebar on page 130.

Most dentists start here, but some miss the point. If you aren't using some sort

of complete management system, which a company has designed to be used clinically with some form of paperless chart, then you aren't ready for the next infrastructure step.

The second element of the technology infrastructure is to establish a network with treatment-room based computers. In other words, put computers in the operatory.

At this time, according to a March 2001 survey by *Dental Products Report* and its sister publication, *Dental Practice Report,* only about 29% of dentists have computers in their treatment rooms. However, this number is growing rapidly, and treatment-room computers will soon be the norm.

There are many reasons for this growth; the most compelling, though, is that a computer in the treatment room is the most logical and the most effective way to use a computer in dentistry.

What makes treatment-room computers so powerful is that they allow for the electronic transfer of information from the clinical area, to the administrative area, and then on to anywhere else the information may be needed, including a third party. That simple electronic transfer process is the key element in the digital revolution. It also is the basic justification for computers in dentistry. Electronic transfer saves time, eliminates duplication of effort, reduces errors, and leads to all the other high-tech marvels we can use in the dental office.

2. Consider the Big 2: digital images/digital radiography

Once the infrastructure is in place, the next step would be to consider what might be thought of as the Big Two: digital images and digital radiography.

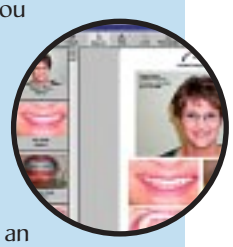
These two technologies have been available for many years. They are fairly mature in their development, and they are essential if the dentist wants to use a truly paperless, digital patient record.

It is possible to use these digital systems without the technology infrastructure in place; that is, without management/clinical software linked to treatment room computers. However, it is hard to do well with digital systems that don't connect to other office technologies. Most offices that do not connect digital to their other sys-

Continued on page 44

EMMOTT UPDATES

Image management



If you are showing patient photos on the computer screen, you are using image management. In its simplest form, image management allows users to capture, store, retrieve, and display an image. It is like an electronic photo album. Some practice management software programs from companies such as Dental.com and EagleSoft have this basic level built right in. Users can capture images directly from any intraoral video camera, digitize the image, and then display it on the computer monitor. Or, users can capture the video image and store it for future display as part of the patient's digital record.

Cosmetic imaging is a more advanced form of image management. Programs such as Vipersoft from Integra Medical, Image FX from SciCan Inc., the Dicom Imaging Suite from DIS Software Corp., and Image 3.0 from Dentrix, have all the basic photo-album features. In addition, these programs allow users to alter the photo using basic photo-editing tools. Usually, the dentist will take a smile photo with a digital camera and enter it into the image management software. Then, the dentist can alter the image to demonstrate the results of treatment.

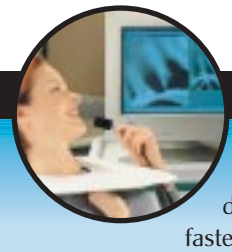
Continued from page 43
tems do not get the full benefit of the digital technology.

For example, trying to use digital radiography on a cart system moved from room to room is possible but awkward. Since the cart must be moved, it tends not to get used. When the cart is used, it must always follow the patient to any room where x-rays are to be viewed. If the radiography system isn't tied to a digital chart, every time it is used, it requires extra time to set up the proper patient files and such.

The Big Two, digital images/digital radi-

Emmott continued on page 130
More sidebars on page 46

EMMOTT UPDATES



Digital radiography

Digital radiography is to traditional film radiography as word processing is to typing. Once you go digital, everything else is easier, faster, and better. There are three main advantages to digital x-rays, as follows:

1. The image is digital. That means it can be stored as part of the digital record, enhanced for better diagnostics, and transmitted electronically.

2. The acquisition is speedy. Once the sensor is exposed, the image appears on the computer screen within seconds. That compares to eight to 10 minutes to unwrap a film, place it in a developer, and then organize, mount, and label it properly.

Note: The greatest speed advantage applies to corded CCD (charged-coupled device) sensors—as from Dentsply Gendex, Dexis, and Trophy Dental—or to CMOS (complementary metal oxide semiconductor) sensors, as from Schick Technologies. While the "wireless" phosphor storage systems aren't as fast at displaying images, they still offer a significant time savings over film processing.

3. The radiation dose is low. Digital x-rays require 60% to 90% less radiation than do traditional x-rays.

Despite these advantages, digital radiography still is not embraced by dentistry as a whole. One reason may have to do with the sensors and software for digital radiography.

Digital x-ray systems have two distinct parts to consider: 1. image acquisition, which is the sensor or plate, and 2. the software, which displays and enhances the image.

In the early development of this technology, companies designed the two parts to work together exclusively; i.e., it was not possible to use any one company's sensor with any other company's software.

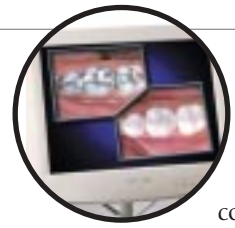
This has started to change. Now, software from companies such as Dentrix, Integra Medical (Vipersoft), and EagleSoft, allow users to capture images with several different sensors. This new flexibility should give greater confidence to those who are buying and upgrading digital radiography, and it may finally help to take it mainstream in the United States.

The cost factor also has slowed the acceptance of digital x-ray. A typical corded sensor costs $6,000 to $8,000. But, that's just the beginning. If the dental office does not have a technology infrastructure in place, setting up a viable digital x-ray system with computers, networking, sensors, software, and all the rest can run into tens of thousands of dollars. However, if the technology infrastructure is in place, an office can get started using digital radiography for under $10,000.

EMMOTT UPDATES

Education and case-presentation tools

Once a high-tech office has its infrastructure in place, various add-on programs are available, as follows:



- **Patient education programs.** These programs, from companies such as CAESY Education Systems Inc. or America's Dental Health (ADH), use slides, full-motion video, and sound to present treatment options. The advantage of a patient-education program is that it frees dentists and staff from endlessly repeating the same thing. It also presents a consistent message from all team members. Plus, it provides documented informed consent, and it is a good third-party endorsement for the treatments recommended.
- **Case-presentation programs.** These programs customize a presentation based on a patient's needs. One example is the PowerCase, a SoftDent program from PracticeWorks. This program takes the treatment plan information from the chart and creates a customized PowerPoint slide presentation.
- **Customized letters.** Another option is Diagnostic Report Plus from Prosynergy Dental Communications; the software program creates a customized letter based on a patient's diagnosis.

Another option possible, once the office collects digital information, is to place a patient's own photographs and x-rays into a personalized Microsoft Word document that can be easily printed or e-mailed.

EMMOTT UPDATES

Diagnostic devices

Many new diagnostic applications use a computer to enhance our ability to find and treat dental disease. These high-tech diagnostic devices include applications for the following conditions:

- **Caries.** Diagnostic software, such as the Logicon Caries Detector from Trophy Dental, actually analyzes a Trophy digital x-ray for interproximal decay. Difoti, a diagnostic system from Electro-Optical Sciences Inc. (EOS), uses light energy in place of x-rays to detect decay.
- **Perio.** A diagnostic system, the Florida Probe from Computerized Dental Products (CDP), connects to a clinical computer and automatically records probing depths and other periodontal diagnostic information.
- **TMJ.** The Model K6-1 or K7 jaw-tracking and EMG (electromyography) system from Myotronics-Noromed is one of the most amazing high-tech diagnostic applications. The system actually can track the movement of the mandible through space in all directions. The system also analyzes muscle activity to help determine comfortable physiologic function. In addition, it uses sonography combined with the 3-D mandibular tracking to determine TMJ function. This system promises to totally revolutionize how we treat the occlusion and TMD patients.

These advanced systems may not be for everyone; some still are in the development stages. However, once again, the point is that once the technology infrastructure is in place, it allows the dentist to add selected applications easily and for less cost.

Emmott continued on page 130

Dental Practice Report's "2002 Technology Guide" covers many more systems in the product categories discussed in this feature. The online guide can be viewed at dentalproducts.net. Click on the Web Extra icon and go to the "2002 Technology Guide" link.

Continued from page 46

ography, can be acquired in either order, together, or not at all. The actual computer functions involved in image management and radiography management are similar, and software developers are beginning to package these two systems together.

3. Add advanced dental applications

There are an amazing number of advanced applications for dentistry that can be added to a basic system once it is in place. These applications range from interactive digital patient-education programs to computerized probes. Advanced applications also include diagnostic software, blood-pressure monitors, jaw-tracking devices, and databases, such as a computerized drug program to replace the old-fashioned paper *Physicians' Desk Reference*.

Once again, it is possible, of course, to use any of these advanced dental systems without a proper infrastructure, but it seems foolish. For example, do you really need a complete computer system just to record perio probings or to monitor blood pressure? Of course not, but if the infrastructure is in place, these applications are relatively easy to add and cost effective.

4. Keep non-dental programs in mind

There are many programs developed for general business use that have great value in the dental office. The most obvious of

Technology connections

To learn more about the digital tools mentioned in this article, contact the following companies listed below. To get information on more digital systems and technologies, visit the *Dental Practice Report* 2002 Technology Guide online at **www.dentalproducts.net.**

COMPANY	TELEPHONE	WEB SITE
Practice management software		
Dental.com	800-832-4776	www.dental-com.com
Dentrix Dental Systems	800-DENTRIX	www.dentrix.com
EagleSoft/Patterson Dental Supply	800-294-8504	www.eaglesoft.net
PracticeWorks	877-901-7800	www.practiceworks.com
Image management		
Dental.com	800-832-4776	www.dental-com.com
Dentrix Dental Systems (Image 3.0)	800-DENTRIX	www.dentrix.com
DIS Software Corp. (Dicom Imaging Suite)	877-624-6243	www.dicom-image.com
EagleSoft/Patterson Dental Supply	800-294-8504	ww.eaglesoft.net
Integra Medical (Vipersoft)	800-791-2434	www.dts-usa.com/vsoft.htm
SciCan (Image FX)	800-572-1211	www.scican.com
Digital radiography (sensors and/or software)		
Dentrix Dental Systems	800-DENTRIX	www.dentrix.com
Dentsply Gendex	800-800-2888	www.gendexxray.com
Dexis	888-88-DEXIS	www.dexisusa.com
EagleSoft/Patterson Dental Supply	800-294-8504	www.eaglesoft.net
Integra Medical (Vipersoft)	800-791-2434	www.dts-usa.com/vsoft.htm
Schick Technologies	800-645-4312	www.schicktech.com
Trophy Dental	800-667-1780	www.trophy-imaging.com
Education and case-presentation tools		
America's Dental Health	800-570-5770	www.a-d-h.com
CAESY Education Systems	800-683-5409	www.caesy.com
Prosynergy (Diagnostic Report Plus)	800-848-8326	www.prosynergy.com
PracticeWorks/SoftDent (Powercase)	800-433-2409	www.softdent.com
Diagnostic devices		
Computerized Dental Products (Florida Probe)	800-460-2772	www.floridaprobe.com
Electro-Optical Sciences Inc. (Difoti)	800-729-8849	www.difoti.com
Myotronics-Noromed (Model K7/EMG)	800-426-0316	www.myotronics.com
Trophy Dental (Logicon)	800-667-1780	www.logicon.com/cariesdetector/
Non-dental applications		
Intuit (QuickBooks)	888-246-8848	www.quickbooks.com
Symantec Corp. (pcAnywhere)	800-554-4403	www.symantec.com

—LE

EMMOTT UPDATES

Non-dental applications

Most dentists will want to use a variety of non-dental applications long before they get into specialized advanced dental programs. An example would be a checkbook program such as QuickBooks or QuickBooks Pro from Intuit, a financial software company. These programs are used to track payables, compute payroll, print checks, and compile accounting reports.

Another program that works well for dentistry is a remote access application such as pcAnywhere from Symantec Corp. This program allows users to log into the office computer from anywhere with a phone modem. This allows team members to telecommute. For example, a staff person could do collection calls from home, confirm appointments, or run reports. Remote access also allows the dentist to deal with after-hours emergencies with the patient's chart right there. The dentist could make chart notes and even schedule an appointment from home.

these is word processing. Every dental office should have word-processing capability from the moment the office is computerized. As a rule, these general business programs are powerful and cost much less than specialized dental applications.

Other examples of non-dental software would include the following: checkbook accounting to track checks sent and received, time clock to record the starting and quitting times of employees, spreadsheets to display accounting data, slide shows for case presentations or marketing, remote access to allow the dentist or team members to work from home, virus protection, and data backups to copy or store files separately from the original.

5. Keep a future focus

If there is one fundamental truth about technology, it is that it is going to change. For this reason, it is best to plan for flexibility. Don't get locked into one solution. Plan for change with modular systems and accessible wiring channels.

For example, one change looming on the high-tech horizon is the Internet. It is not essential that a dental office be using the Internet now, but we will see the Net being used in very creative ways to benefit dentistry in the next few years.

And remember, "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, Ariz. He also is an award-winning speaker who has addressed hundreds of professional groups. He is 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. Since 1995, he has written a monthly electronic newsletter,* Emmott on Technology, *which shows dentists how to minimize costs and maximize profits in practices through effective use of technology. Visit his computer-users Internet Web site:* ***www.drlarryemmott.com.***

Photo credits

- Photo of Dentrix Version 9.0 practice management software on pages 40 and 42 courtesy of Dentrix Dental Systems.
- Photo of EagleSoft's Version 8.00, an advanced imaging part of the company's practice management software, on pages 40 and 43 courtesy of Eaglesoft, a Patterson Dental Supply company.
- Photo of the GX-S USB sensor on pages 40 and 44 courtesy of Dentsply Gendex.
- Photo of patient education program on pages 40 and 46 courtesy of CAESY Education Systems.
- Photo of the K7/EMG jaw-tracking system on page 40 and 46 courtesy of Myotronics-Noromed.
- Photo of QuickBooks payroll software on pages 40 and 131 courtesy of Intuit.