

COMPUTERS AND THE ORTHODONTIST

COMPUTERS IN ORTHODONTIC PRACTICE GENERAL CONSIDERATIONS

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Computers may be used to benefit numerous areas of orthodontic practice. The efficiency of both word processing and computerised patient billing systems are unmatched by their manual counterparts. Computer-assisted cephalometric analysis and video imaging techniques are also becoming more commonplace as they become increasingly affordable. However, despite the advantages that computers provide to daily orthodontic routine, computerising an orthodontic surgery requires careful planning and consideration.

The improved performance of computer hardware and software, together with an associated decrease in costs, has meant that computers have become an effective and affordable alternative for managing many of the procedures encountered in daily orthodontic practice. Whereas specific computer requirements will vary from practice to practice, certain fundamentals are consistent when computerising a surgery; these topics will be covered in this, and in a follow-up series of articles in this journal.

It must be remembered that the computer world is a rapidly changing one. The power of hardware doubles every eighteen months and software changes in quantum leaps with more or less the same frequency. As such, some information may be out of date before it goes to press and all information should be considered a guide only. This series of articles will be written from an IBM perspective but,

thankfully, the differences between Apple Macintosh and IBM platforms is now decreasing. The new range of Apple computers, known as Power Macintoshes, are able to run IBM software; and the newest version of the IBM-based Windows user interface, due for release early in 1995, is likely to closely emulate the current Apple Macintosh desktop user interface. Other application software for the IBM-based machines and the Apple Macintosh is already almost identical.

The extent to which computers may be used in an orthodontic practice is ever increasing. Typically, they have been used for word processing, patient billing, for general accounting and generating everyday practice management information (Abelson, 1992a,b). Some practitioners may also choose to use them for appointment scheduling, inventory control and calculating staff wages. More recently, with the introduction of computer-assisted cephalometric analysis (Halazonetis, 1994), video imaging (Duncan 1994), electronic storage of patient records, the creation of clinical databases and the use of specific software for presenting information to patients and professional colleagues, the emphasis of computer usage has become clinically orientated.

However, in-house personal computers may not always be the most appropriate solution to the practice problems: it may still prove more efficient and economical to send cephalometric records and financial

records to a third party, and such alternatives should always be considered. Similarly, it may be preferable to utilise a dedicated system for a specific task rather than to try to incorporate everything into one or two computers: for example, a practitioner wishing to use electronic media to explain a treatment plan to a patient may do better to consider the Ormco CDI system rather than customise a presentation software package available on either the IBM or Apple Macintosh formats.

Most practitioners will be familiar with the terms "hardware" (the physical computer machinery) and "software" (the electronic instructions that convert the hardware into a word-processor, billing program, cephalometrics package or the like). The power of recent hardware and the comprehensiveness of current software ensure that, with some exceptions, adequate computer alternatives for day-to-day procedures may be achieved with off-the-shelf products. More complex systems are generally not required to assist the running of orthodontic practices.

Before making the decision to computerise, a practitioner must first determine what specific tasks will be required of the computer and then make a list in order of priority. The key is to think laterally and, if anything, overestimate how much the system is likely to be used. This extends the period before the selected hardware and software are likely to become

obsolete. Secondly, it is advisable to then select the software which can best manage the practice requirements, ensuring adequate access to upgrades and support. The proliferation of software developed for small business has meant that, more than likely, numerous choices are available and it is often useful to discuss your needs with someone who is already using the software under consideration. Thirdly, the hardware best suited to run the selected software is then chosen, thereby forestalling the problems of buying a computer system which is not capable of doing what it was bought for. Thankfully, the increased availability of specialised softwares, and the convergence of user friendliness and pricing of both IBM and Apple Macintosh machines, have largely overridden the importance of this decision making process.

The computing power of hardware is discussed in terms of the type and speed of the central processing unit (CPU), the amount of random access memory (RAM), and the size and speed of the associated hard disk drive. The amount of memory deployed specifically to manage the screen image as well as the resolution and type of video monitor are also important.

Currently, state-of-the-art IBM technology utilises either the Pentium chip or a 486DX4/100MHz chip as the CPU. Software is not yet available to fully utilise the power of the Pentium chip and the next generation of Windows software is likely to be the first designed for the new hardware technology. It is anticipated that developments in word-processing and other office software that take full advantage of the Pentium chip will take a further one or two years to develop and become available. Specific orthodontic software for the Pentium chip will take even longer to reach the marketplace. Similarly, when the cost benefit of the fastest of the 486 CPUs is considered, it is difficult to justify; and, moreover, such machines are probably more powerful than is needed to run an orthodontic practice.

Currently, a 486DX2/66MHz IBM-compatible machine may be obtained for little more than IBM clones that are slower and limited in their potential to upgrade. It is probably worth spending

the extra money to obtain a 66MHz, 486 machine. The general trend for software to require greater amounts of computer memory and hard disk storage dictates that a machine with 8 Mb of RAM and a 200Mb hard disk would be a prerequisite; if video imaging is being contemplated, 16 to 32Mb of RAM and a 400Mb hard drive should be considered. A low radiation, high resolution, non-interlaced monitor, which gives a better image than a standard screen, is worth the extra \$700 if it can be afforded. A laserjet printer can produce professional-looking documents quickly, quietly and economically; and costs \$1500 to \$2000, depending on the speed required. A removable hard disk drive should also be considered to back-up practice data. The hardware requirements for orthodontists considering Apple Macintosh systems have been detailed most recently by Duncan (1994).

The benefits of computerising an orthodontic practice need to be weighed against the software and hardware costs and the time of the learning processes for the practitioner and staff. The physical size of the computer should also be considered. Computer systems rarely replace staff but do make existing staff more efficient, allowing them more time to devote to the assistance of patients and other staff in the practice. Records may be made more accurate and complete, as well as quicker and easier to access. Generally, the introduction of a computer system to a practice will not require additional staff members or staff time unless specific extra duties, such as cephalometric tracing and video imaging, are introduced into the practice when it becomes computerised.

Computers streamline procedures but they also highlight and accelerate any disarray in office routine. Therefore, if the benefits of computerisation are to be maximised it is imperative to have an ordered practice infrastructure. For example, an ill conceived billing system will remain ill conceived regardless of whether or not a computer is used to produce the accounts.

Practitioners who are computerising their surgeries should become conversant with the software they are

using. All good application software functions without the need for the user to become involved with the underlying operating system; however, basic familiarity with some computer fundamentals, such as the disk operating system, are bound to be beneficial in reducing the amount of outside assistance that may be otherwise needed.

Even considering the rate at which computer hardware becomes outdated, it is still worth investing in a computer for orthodontic practice. The benefits of word processing alone justifies the outlay. Purchase only the hardware likely to be used in the foreseeable future and buy new software when it is needed. Realistically, computer hardware should be upgraded every three to five years and the older machines used in less demanding areas of the practice or taken home for the family. "Computerphobia" may have been warranted in the past, but recent advances in software have made those who once considered themselves "computer illiterates" confident with computers in a very short time. Nearly all practitioners who have computerised their practices have tales of the difficulties they encountered in the early stages; however, without exception, none would return to manual ways.

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