

AN INTRODUCTION TO Tablet PCs

With this technology, you can access and update electronic medical records from anywhere – with a keyboard or a pen.

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Many aspects of medical practice are being revolutionized by innovative technologies. The Internet, personal digital assistants (PDAs), electronic medical records (EMRs) and wireless technology are gradually making their way into physician practices. Tablet PCs, which have just become available in the last couple of years, are another example of a new technology that has expanding utility in medicine.

What is a tablet PC?

A tablet PC is a truly portable computing tool. It is as powerful as a modern PC, but it doesn't require a keyboard. Instead, using "digital ink" technology, you can add information by writing on the screen (or "tablet") with a digital pen or "stylus," much like you do in a patient's paper chart. There are two main types of tablet PCs: a slate tablet PC, which is a tablet with no attached keyboard (though one can be added), and a convertible tablet PC, which is basically a laptop computer with a screen that can swivel and fold onto the keyboard to create the tablet.

Tablet PCs are powered by a special version of the Microsoft Windows operating sys-

tem called Windows XP Professional – Tablet PC edition, which contains the features of a standard desktop operating system and those specific to tablet PCs. Though an abundance of additional software is not yet available, tablet users can purchase several applications that harness a tablet's unique features. For example, the Microsoft Office applications have many pen-enabled functions (<http://www.microsoft.com/office/editions/prodinfo/tabletpc.msp>), FranklinCovey offers a personal planning application for tablet PCs (<http://www.franklincovey.com/tabletplanner>) and AbleFactory has some special-interest dictionary (SPID) applications that can improve the tablet handwriting recognition of medical terms, drug names and abbreviations (<http://ablefactory.com>).

The cost of a tablet PC ranges from about \$1,500 to \$2,500. This generally includes the tablet with built-in wireless capability, the pen, the tablet operating system and, in some cases, additional software or hardware. If it's not already included with the tablet, optional additional hardware may include a floppy or CD drive, a mouse, a keyboard or a docking station. While the cost of a docking station, which can turn a tablet PC into a full-functioning desktop computer, can be about \$200 to \$300 and the cost of a floppy or CD drive can range from \$65 to \$300, the costs associated with the other optional hardware are minimal. (See "Comparing tablet PCs.")

Putting a tablet to use

Tablet PCs have a number of features that make them especially appealing and useful to physicians: portability, wireless capability, handwriting and speech recognition capability and security options. Of course, any new



Toshiba Portegé

Photo provided by Benjamin Group Public Relations



Motion Computing M1400

Photo provided by The Alliant Group

COMPARING TABLET PCs

The price, weight and battery life of a tablet PC can vary significantly among different models. Here's a comparative list of some of the tablet PCs currently available.

Model	Price*	Weight	Battery life
Motion Computing M1400 http://www.motioncomputing.com	\$1,649 to \$2,351	3 pounds	3.5 hours
Toshiba Portegé M200/M205 http://www.toshibadirect.com	\$1,777 to \$2,348	4.4 to 4.6 pounds	4 hours
Compaq tc1100 http://h18000.www1.hp.com	\$1,649 to \$2,299	3.1 to 4 pounds	3 hours
Electrovaya Scribbler SC2100/SC2010 http://electrovaya.com	\$1,999 to \$2,599	3.5 to 4.5 pounds	9 hours
NEC Versa LitePad http://nec.com	\$2,399	2.2 pounds	2.5 hours

*Price information was gathered from each manufacturer's Web site as of Sept. 10, 2004.

technology also comes with its own set of problems. Here's a discussion of some of the tablet PC's benefits and drawbacks:

Portability. When most people envision a computerized office, they probably think of a big PC in every room. However, that PC will not budge when you want to take a trip to the sample closet or leave the room to confer with a consultant. The tablet PC gives you the portability of a PDA and the increased screen size and power of a desktop PC. Although some tablets can remain unplugged for as long as nine hours, most will need to be recharged within four hours. All-day portability can be maintained by charging your battery at lunch or carrying an extra battery with you. Depending on how much you carry your tablet around (and especially if you carry an extra battery), the weight can become burdensome at times. However, the average weight of a tablet, which is only about three pounds, is smaller and more manageable in many cases than that of the equivalent paper charts.

The portability of a tablet can also be a drawback since it has unique pieces, slot covers and pens that can be broken or lost. The hinge on a convertible tablet that allows the screen to swivel may be especially prone to wear-and-tear, depending on how well it's made. You can provide some general protection for your tablet by using a portfolio or

sleeve case, which is usually made of nylon, leather or neoprene, depending on which tablet you have. There are also "ruggedized" tablet PCs available that are covered with external casings to protect them from falls and external elements. Though ruggedized tablets are intended mostly for use in outdoor industries, such as telecommunications, utility work and emergency services, and are heavier, they may be worth considering if your tablet gets damaged often.

Wireless capability. Tablet PCs can recognize and connect to wireless networks with no added hardware required. This allows physician users to quickly and easily access the Internet or their network, for example to review patients' EMRs, research a particular drug or look up ICD-9 codes. Of course, this capability is only useful if you have a wireless network in place in your practice or hospital. (For more on wireless networks, see "A Primer on Wireless Networks," *FPM*, February 2004, page 69).

Handwriting and speech recognition capability. With digital ink technology, a tablet PC uses a screen digitizer to turn your print or cursive handwriting into text that can be inserted into documents. This can be especially useful when you're taking notes at a meeting or filling out a documentation template at a patient visit. Since the digitizer

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Tablet PCs are an example of a new technology that has expanding utility in medicine.



Using "digital ink" technology, the tablet PC allows you to write on the screen or "tablet" much like you do in a patient's chart.



By adding a keyboard and docking station, a tablet PC can also function as a standard desktop computer when necessary.



The cost of a tablet PC ranges from about \$1,500 to \$2,500, and the weight and battery life can also vary significantly among different models.



The features of tablet PCs that make them especially appealing to physicians are their portability, wireless capability, handwriting and speech recognition capabilities, and security options.



Some of the drawbacks of certain tablet PCs include a relatively short battery life, a somewhat burdensome weight and a proclivity to wear-and-tear.



Despite these problems, the author has found his tablet PC to be a great resource in his practice, assisting him in patient care and resident teaching.



Mastering all the features of a tablet PC can take time, but it's well worth it.

THE IMPACT OF A TABLET PC

After using my convertible tablet PC in practice for eight months, I have come to depend on it. Having been given wireless Internet access throughout our hospital, I am able to enter the hospital's electronic medical record (EMR) and e-mail systems via the Internet and access patient labs and reports while I'm in their hospital rooms. The digital pen features available in the Microsoft Office applications that I purchased for my tablet have been useful for resident conferences and faculty brainstorming sessions, since the tablet becomes an immediate digital blackboard when it is displayed on a projector screen.

Of course, I've had my share of frustrations with the tablet PC as well. My convertible tablet is heavier than most, which makes it somewhat of a burden to carry around the hospital for prolonged periods, and I'm never sure where to put the tablet while I'm examining the patient. While my battery has never run out during rounds, it has come close; and I've found that carrying an extra battery around the hospital is not practical. Another problem for me is that our office's wireless network does not reach to my patient rooms, which severely limits the usefulness of my tablet in that setting.

Despite these frustrations, I am extremely happy with this new technology. It has already had a significant impact on my patient care and faculty responsibilities. Because of its portability, power and impact at the point of care, I believe the tablet PC will become an integral part of the EMRs and wireless networks that are being incorporated into hospitals and practices.

will only respond to the proprietary pen or stylus, resting your hand on the screen does not interfere with the digitizer and is, in fact, encouraged for writing stability. Tablet PCs perform handwriting recognition quite well and are even better at converting cursive than print. The tablet also gives you the option of inputting text using the PDA block letter recognition systems.

Of course, even a perfectly functioning screen digitizer, which is likely the most sensitive part of a tablet PC, may have some minor problems. For example, the cursor may "drift" when the pen is hovering near the edges and corners of the screen to close applications or manipulate scroll bars. Fortunately, this and other similar problems can be minimized by calibrating the digitizer and increasing the size of buttons and bars on the screen.

Speech recognition is another feature of a tablet PC that may be appealing to physicians. The tablet takes the user through a speech-training module and then allows him or her to easily activate the speech-recognition feature with the touch of a button. While speech recognition may still not be good enough to serve as a complete replacement for your medical transcriptionist, it can

be useful, especially if you are using a template-driven medical record in your practice.

Security options. As with any computer, appropriate use of passwords and data encryption technology can help to protect personal and patient information on your tablet. Because device theft may be a concern with this type of portable computer, one of the tablets currently on the market comes with a movement sensor that can be used to trigger an alarm and another comes with an integrated fingerprint reader for enhanced data security.

Is it right for you?

This technology has been a great resource in my practice, assisting me in patient care and resident teaching. It has also helped me to show our hospital that our practice is ready for an EMR. Whether a tablet PC is right for you depends on how much you

use PC applications in your practice now and how much you are willing to learn about this new technology. Two good places to start are <http://tabletpcbuzz.com>, which has general support, tips and recommendations for tablet PC users, and <http://medicaltabletpc.com>, which provides information specific to the use of tablet PCs in medical practices. Even once you've purchased a tablet, mastering all the features it has to offer can take time. But once you get used to using a tablet PC in practice, you may find that it is just what the doctor ordered. **FPM**

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