



**Surgeons
pocket PDAs
to end
paper chase**

Part I

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Until four years ago, Robert Tuchler, MD, FACS, was awash in paper. On the go from early morning to late evening—from the operating room to the office, continuing medical education (CME) session to staff meeting—the Denver, CO, plastic surgeon had no choice but to lug around a cumbersome daily planner stuffed with business cards and Post-It® Notes etched with hastily scribbled patient and referring physician phone numbers. He would rifle through pockets bulging with loose-leaf slips that chronicled appointments, to-do tasks, personal reminders, and piles of CME credit forms and crumpled expense receipts. Worst of all, because he couldn't very well cart around the latest edition of surgical texts and journals or the *Physician's Desk Reference*, he had no access to the most up-to-date diagnostic and therapeutic information or to a quick-and-easy guide to resolving complicated or unusual clinical presentations at the bedside.

All that changed when Dr. Tuchler purchased a personal data assistant (PDA). Not only does the hand-held computer simplify tracking of often maddening administrative details—his full surgical schedule and office appointments, personal and professional phone numbers, and patients' insurance eligibility information—but the PDA regularly compiles, stores, and downloads Dr. Tuchler's CME credits.

On the clinical side, the PDA contains notes on dealing with emergencies, such as antidotes to poisoning injuries, an electronic dermatome chart that explains how to treat uncommon conditions such as certain types of spider bites, and complete guides to medications, antibiotics, and infectious diseases. "There's nothing, information-wise, that you couldn't get from a library. But when you're in the recovery room writing postop orders or in the ER in the middle of the night or get a phone call from a patient at 4:00 in the morning and you can't run for your books, it's nice to be able to hit a button and have the answer at your fingertips," Dr. Tuchler said.

A small but growing number of surgeons are adopting hand-held wireless technology, and they're finding it to be indispensable. Even if Dr. Tuchler is running out to a mall in a pair of shorts, he slips his PDA in a back pocket. "I can't tell you how many times I've gotten an emergency call or

had to call a patient and needed a particular fact or a phone number," he said.

Not surprisingly, surgeons most commonly use the devices for simple clerical tasks—serving as an address and appointment book, personal and professional calendar, expense and CME tracker. But surgeons are beginning to perform more sophisticated functions—compiling searchable patient profiles and capturing charge and encounter data at the point of care.

Surgeons also are finding many clinical applications for their PDAs. Sidney F. Miller, MD, FACS, a general surgeon from Dayton, OH, connects a digital camera to his hand-held computer to monitor patients' progress after burn injuries. Barklie Zimmerman, MD, FACS, a vascular surgeon from Richmond, VA, maintains a database on aneurysms. David Lowry, MD, a neurosurgeon from Grand Rapids, MI, enters postop orders and notes in the recovery room. Roger Simpson, MD, FACS, a plastic surgeon in Garden City, NY, checks for potential drug interactions, the mechanism of action of new medications, and the appropriate antibiotic to counteract specific infectious diseases.

And surgeons are learning that PDAs are more than convenient alternatives to paper for recording and saving information. The devices improve the accuracy of diagnosis and billing, enhance the flow of information between physician and office staff, and speed access to patient-specific data as well as clinical practice guidelines and therapeutic templates.

This article reviews the administrative applications of PDAs. Next month, Part II will discuss surgical software for hand-held computers.

Gathering patient data

The charge capture and coding system for the department of surgery at Duke University Medical Center, Durham, NC, has been inefficient and incomplete for years. Because it centered on desktop computers, surgeons had to wait until they gained access to one of the department's workstations to record patient interactions. Unless they could round up all their scattered notes, by the time they sat down in front of a terminal, surgeons often would forget to include all the relevant documentation details to support specific charge codes and to meet Medicare fraud and abuse compliance requirements. As a result, according to Lloyd Hey,

MD, assistant professor of orthopaedic surgery at the Duke University Health System Spine Center, about 18 percent of all charge sheets had to be returned to surgeons' offices because an essential item of information was missing. Surgeons at Duke also often overlooked individual patient visits or interactions, which reduced their payment rates.

Since the department began instituting a PDA-based charge capture system six years ago, it has seen improvement in overall data collection. The average number of diagnoses identified by surgeons increased from 1.1 to 2.8 per patient encounter, and the fax-back rate has dropped to zero, Dr. Hey said.

The system also is helping to streamline inpatient admissions by generating a daily rounding list of patients for every surgeon that indicates where inpatients are located and when they are nearly ready for discharge. "By being able to identify a pending discharge, our system shows that a bed will be available in day or so, and that allows better planning and utilization of resources," said Robert Anderson, MD, FACS, chair of the department of surgery.

The PDA charge capture software makes it possible for surgeons to enter billing data whenever they have a few spare minutes. Dr. Hey's experience is typical: "When I arrive in the morning, I download my rounding list into my PDA and then start doing my inpatient rounds. As I see each patient, I can actually put in what was wrong with the patient and what I did about it right there at the bedside. When I go to the OR or the ER, I can do the same thing. At the end of the day, I can synchronize my PDA with the main computer, and I don't have to be at the hospital; I can do that at home. And all the patient encounters that I had that day flow electronically from my PDA through the computer, to the server, and on to the billing service," he said.

The end result is reassurance, said Dr. Hey, who developed the MDeverywhere™ charge capture system that is being used at Duke and other medical centers, such as Brigham and Women's Hospital in Boston, MA, and small group practices. "During my day, I have 100 percent confidence that I'm seeing 100 percent of the patients I'm supposed to see. At the end of the day, I know that 100 percent of my cases were captured accurately.

As life gets more hectic and my practice grows, the hand-held gives me a sense of confidence because it acts as my assistant as I'm seeing patients."

A byproduct is greater efficiency in the department of surgery and in individual physicians' practices. Because encounter data are captured by the surgeon immediately at the point of care, they are more accurate and complete, eliminating the need for office staff to rework claims. The data also are transferred directly from the PDA to the office computer by placing the device in a cradle, a process known as "hot synching," so office staff can stop wasting precious time chasing down bits of paper that were incompletely filled out in the first place. To cite one example, Duke's department of ophthalmology shaved its time to billing from 13 days to one.

In the office setting

Only a small percentage of physicians are using PDAs for charge capture and other types of transactions in their practices, such as dictating progress notes or operative reports, writing prescriptions, and accessing laboratory results. According to an analysis of the hand-held market by the San Francisco-based investment firm WR Hambrecht & Co., only 15 percent of physicians were using PDAs at the end of 2000, primarily for scheduling purposes. But Hambrecht anticipates that up to 20 percent of physicians will be turning to PDAs for transactions within three years.

And convenience will not be the only driving force; cost also will be a factor. Wireless local area networks for acquiring data at the point of care can run \$25,000 or more. PDA hardware and software are under \$1,000. So it's only a matter of time, say PDA advocates, until the devices will prove they're up to the task of handling all the data physicians' offices need to process, departmental and office information systems get the kinks out of PDA-based systems, and surgeons become accustomed to using PDAs for billing and other complicated office operations.

Meanwhile, surgeons most likely will follow the lead of early adopters of hand-held technology, such as Dr. Miller, and turn in their appointment books for a PDA.

Until Dr. Miller bought his hand-held device, he was no different than any other busy general sur-

PDAs: How do they stack up?

According to *pdasurgery.com*, the choice of a PDA depends on its cost, memory capacity, and size. The Web site provides a side-by-side comparison of the most common hand-held computers that use the Palm OS. The following is excerpted from that comparison.

Device	Price	Memory
Palm™ m100 series	\$149 - \$199	2 or 8 megabyte
Palm III series	\$149-\$449	2, 4, or 8 megabyte
Palm VII series	\$349-499	2 or 8 megabyte
Palm V series	\$329-\$399	2 or 8 megabyte
Visor™	\$179	2 megabyte
Visor Deluxe	\$249	8 megabyte, expansion
TRGPro™	\$329.99	8 megabyte
Sony Clie™	\$349	8 megabyte, expansion
IBM Workpad c3	\$384.99	8 megabyte

Smaller and thinner PDAs include the Palm Vx, Palm M 505, Sony Clie, and IBM Workpad.

In addition to the systems that run on a Palm OS, the Hewlett Packard Jornada and Compaq iPAQ Pocket PC synchronize with Windows® and Microsoft Outlook, Word, and Excel. The Compaq iPAQ has 32 to 64 megabytes of RAM and 16 megabytes of ROM and runs around \$500; the HP Jornada model 545, which has 16 megabytes of memory, is about \$850, and the 548 model, with 32 megabytes of memory, is more than \$1,000.

geon: in a constant paper chase with office staff to make sure everyone was on the same calendar page with the most up-to-date appointments, addresses, and phone numbers. But now, instead of shuffling bits of paper back and forth, and hoping they don't get lost or misplaced somewhere along the way, all he has to do is hot sync his hand-held device with his computer, and he and his secretary can make instant changes to his schedule.

And like Dr. Miller, surgeons also may start experimenting with other uses of hand-held computers. For the last few years, for example, Dr. Miller has been taking his PDA on trips to medical meetings along with a keyboard that collapses to the

size of his palm. As a result, when the lights come up after a formal paper presentation, Dr. Miller can pull out his PDA, open the keyboard to standard size, and type in notes about the talk. He also can enter travel expenses directly into the device. Once he's back at the office, he can sync the device with the computer, which copies expenditures onto an Excel worksheet for tracking and completing travel requisitions.

Surgical residents can find even more applications for the devices: tracking the cases they perform for the American Board of Surgery, to name one. "The American Board of Surgery has made available an option to collect this information on a hand-held device. So residents, right after they leave the OR, can go into the surgery lounge, pick up their hand-held device, and type in the patient's name, the operation, the date, the attending surgeon's name, and their participation in the operative procedure—all in about 30 seconds. Then once a week or every month, they can come over to the department office and give their hand-held device to the secretary, who syncs it with the computer and downloads all the information," said Dr. Miller, professor of surgery at Wright State University and director of the Miami Valley Hospital Regional Adult Burn Center, both in Dayton, OH.

The process also gives the department of surgery at State University of Dayton much more complete data, much more promptly, he added. "We used to have to call up the residents and bug them, and they were still about two months behind. And they were always trying to piece things together because they forgot to write down their operative cases as soon as they came out of the OR. Now they carry the hand-held device in their shirt pocket and pack all that information in this thing that's just a little bit bigger than a pack of cigarettes."

Getting started

Every hand-held computer comes with a suite of applications, or a skeleton, as Dr. Tuchler calls it, that will meet almost any surgeons' clerical needs: an appointment scheduler, phone directory, to-do list, and the ability to type short memos. There are dozens of Web sites that offer software, free of charge or for purchase, exclusively for physicians to expand PDA applications. In addition

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to Dr. Hey's MDeverywhere, surgeons can get wireless charge capture software from MedCompanion, inpatient billing and tracking and coding through PocketMed™ or Pocket Patient Billing, a Web-based transaction service through PulseMD, and charting programs via Digital Assist and Medical ChartWriter.

Some of these programs are designed to work on a particular type of PDA—usually the Palm Pilot, which runs on the Palm Operating Systems (Palm OS)—and they typically require eight megabytes of memory, Dr. Tuchler said. Surgeons also can choose between PDAs that have black-and-white or color screens and devices that can be fitted with accessories, such as a digital camera or scanner and expanded memory.

How to choose? Dr. Tuchler suggests that surgeons who are afraid of making an investment in

technology they may not use try an entry-level unit, which costs about \$120, join a physicians' bulletin board and chat room to learn how other surgeons use PDAs, and check out some of the medical Web sites that provide free software. Above all, he said, "don't be afraid to give it a try." Surgeons who are anything like Dr. Tuchler will find that "once you use it, you'll be afraid to leave the house without it." □

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