inhalation, many blood chemistry tests will be performed transcutaneously, and immunizations will be administered by nasal sprays or foodstuffs. Aroma scanning technology that is now in development will facilitate early detection of bacterial infections using sensors that literally "smell" for evidence of bacterial growth.

As exciting as these prospects are, true advances in pediatric practice will come from technologies that improve the ways we document patient visits, track tests, generate prescriptions, and arrange referrals in the complex and confusing environment of managed care. I am convinced that this can and will be achieved by the convergence of handheld devices, electronic medical record (EMR) systems (also called computerized patient medical records), and wireless technology. I am pleased to report that these technologies are becoming more sophisticated and affordable all the time.

For several years physicians have been using the popular Palm Pilot to store patient and pharmacy contact information, look up drug information, and even record visit notes. While I have been a big fan of the Palm Pilot, the new generation of Windows CE Pocket PCs (Casio's Cassiopeia, Compaq's IPAQ, and Hewlett-Packard's Jordada) has surpassed the Palm Pilot in features and ease of use. Medical applications for these devices are rapidly becoming available.

Pocket PCs feature backlit color screens, voice recording, expedited note writing with optical character recognition (capable of converting even our sloppy handwriting into legible text) and the ability to synchronize this information with a desktop computer. Price tags for the devices begin at $400, and most can be equipped with modems, wireless transmitters, and extra memory.

A new Internet-based resource, Handheldmed, provides a service called MobilePractice, for either your Palm Pilot or Pocket PC. For a subscription that costs $180 per year you can download more than 60 licensed titles from their "PocketClinician" library, including the *Merck Manual*, NeoFax, the *Physician Drug Handbook*, *The Common Symptom Guide*, *Principles of Critical Care*, and others. By the time you read this the *Red Book* and *Harriet Lane Handbook* should also be available. In my experience it's been a great time saver to have a resource library that you can hold in your hand and navigate with simple search screens.

A Handheldmed subscription also entitles physicians to download and use a Pocket PC application called Patient Tracker. Patient Tracker lets you record a brief office or hospital note that includes patient history, vital signs, and lab and test results and produce a printout by beaming the information to a printer equipped with an infrared port.

Another excellent medical resource for use with personal digital assistants is Skyscape, which offers complete adult and pediatric drug databases, called Lexidrugs, for both the Palm and Pocket PC platforms. They provide quick access to appropriate dosages, preparations, side effects, and drug interactions. At $65 each, the databases are quite affordable.

A prescription writing service called iScribe is now available throughout the country. When you enroll in iScribe, a free pocket PC with preinstalled iScribe software and an infrared printer are delivered to your office. Daily patient lists from your billing software are downloaded into the pocket PC so that the iScribe software can quickly generate prescriptions during patient visits. The prescription is transmitted to the printer and then handed to the patient. In the future prescriptions will be delivered electronically or by fax directly to the patient's pharmacy.

CompuKID: Tomorrow's office management today

Dan Freiling is an experienced computer programmer who had the good fortune to marry a pediatrician. He knew that pediatric practices desperately needed a better way to document visits, create legible chart notes, track immunizations, and educate parents—and he knew that computer software could achieve this goal. His brainchild—a combination of pediatric electronic toolkit and electronic medical record called CompuKID—was released six years ago as a DOS–based program for PCs. It is now one of the most popular EMR systems for pediatric practices with more than 200,000 visits and 500,000 immunizations documented.

Freiling boasts that physicians who use CompuKID have received perfect scores when audited by insurance companies, no small achievement. CompuKID has been renamed e-CompuKID and is now being transformed into the pediatric practice management program that we all dream of.

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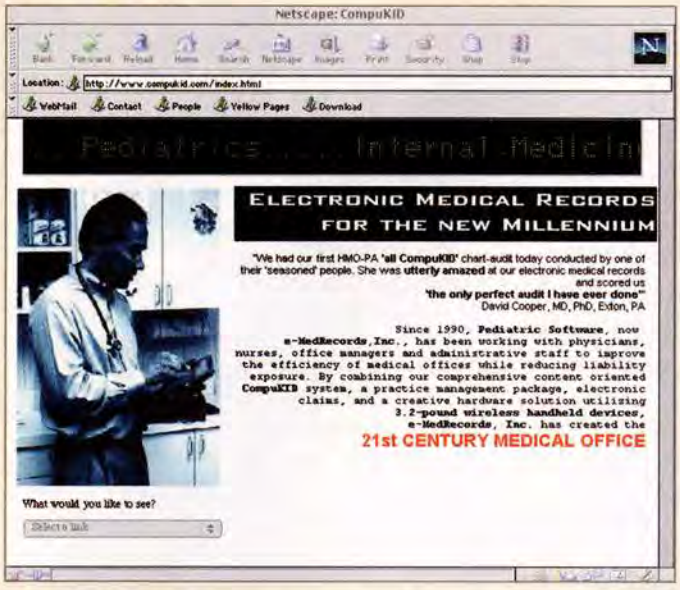
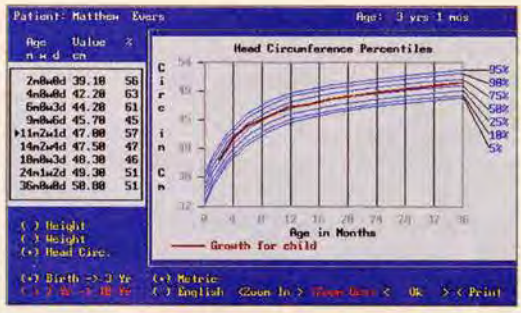
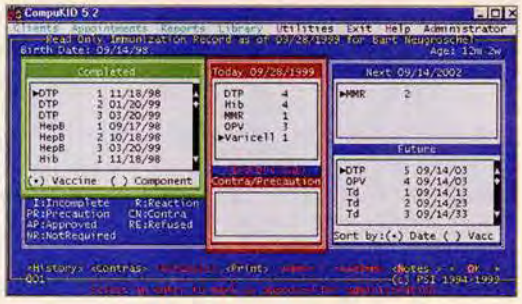
FIGURE 9







e-CompuKID is a wireless, Internet-based practice management system that integrates an EMR with a billing program, patient scheduler, word processor, drug database, prescription software, and an accounting program.

Fewer than 5% of physicians use EMRs because they have been prohibitively expensive. It is not unusual for initial installation, including hardware and software, to cost more than $20,000 to $25,000. Current primary care EMR systems require a hardwired computer network, and practices must continue to use a separate billing program. The new e-CompuKID is a wireless, Internet-based practice management system that integrates an EMR with a billing program, patient scheduler, word processor, drug database, prescription software, and an accounting program.

The heart of the system is a single Internet-connected PC outfitted to support a wireless network. Nurses and doctors use sturdy, portable, large-screen, Windows CE–based, solid-state handhelds that all share the same information across the network. Users can enter information with a stylus on a touchscreen or a traditional keyboard.

Here is how it works: When a parent and child enter the office, the receptionist updates her computer to ensure that all information is current and indicate that the patient is ready to be seen. The nurse brings the child back to the exam room, takes vital signs, and records a nursing note on the handheld. When the nurse is finished, an electronic flag appears on the physician's handheld. When the doctor enters the room to do the interview and exam, all active problems, medications, and recent tests are readily available on quick-view screens. Inputting the office note and updating the patient's problem list on the handheld takes a fraction of the time it would take to write an illegible note.

The physician can quickly generate school forms, prescriptions, instruction sheets, lab or X-ray request forms, and a printed note for the chart record along with a superbill. Best of all, the appropriate forms and requests can be sent electronically wherever they need to go—the pharmacy, school, insurance company, consulting physician, and so on.

All information in the system is archived over the Internet on the e-CompuKID servers. This means that the integrated program modules can be upgraded without a technician visiting the office to install software and all information is secure. Such a system expedites reimbursement because data is transferred seamlessly to the integrated billing program, which files an automatic electronic claim for services upon completion of the visit. The information can be accessed anywhere there is a PC connected to the Internet—office, home, hospital, or on the road via a wireless Internet device.

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