Devices & Methodologies for Capturing Data

By William E. Ott

I believe we're approaching an interesting era in data capture in EMS. All services capture data in some form or fashion—most on paper, some electronically. As demands for electronic filing and the need to improve and expedite collections mount, more and more EMS systems will move toward creating or joining data systems.

Many possibilities for how to best capture data exist, including scanned paper forms, Web-based systems, PC-based systems, notebook PC-based systems, PocketPC systems, Palm-based systems and voice dictation.

All these solutions have their pros and cons. Scanned paper forms are comfortable and easy to use, but limit the amount of data that can be collected. Also, changes are difficult to make in the collection form.

Web-based systems are nice because a well-developed system can run on any type of hardware, use the Internet for connectivity and allows for data structure changes to be made quickly.

PC-based systems that connect to a server are comfortable, can use the Internet via a virtual private network (VPN) for remote connectivity and allow for quick collection of data changes. (For more information on VPNs, see March e*JEMS*, p. 148.) Notebook PCs fall into the PC realm, except they're portable and may have wireless access in a vehicle. They tend to be expensive and fragile, however.

Personal digital assistants (PDAs) such as Palm based devices and PocketPC's are portable and light, can be tedious to work with and are somewhat fragile. However, they're inexpensive enough to be throwaway items when broken.

Voice dictation systems have little drawback other than cost. You simply call a number and speak to a report taker, who can guide you through all necessary questions based on response type, all while en route to another dispatch.

Various combinations of these data collection tools are in use around the country today, and there's no clear winner as yet. As more and more agencies get serious about data collection and reporting, we'll likely see one of these technologies become dominant in the industry. Several states currently have or are developing statewide data systems, and most seem to be either Web- or PDA-based that send data to a central database.

My opinion at the moment is that the notebook PC option is too expensive, in initial costs, as well as in maintenance, repair and replacement, compared to the other options. However, if the agency is one where the crew is in their unit for the entire shift, nearly every shift, notebooks are a good option and they should have wireless access from the vehicle to the Internet and to the database server.

In the past 10 years, some services have done OK with notebooks in vehicles, but many have not. Computer ruggedness, available power supply and boot-up and shutdown times are all major issues with

notebooks. The good, rugged notebooks are expensive; in fact, you can easily buy four to eight well-equipped desktop PCs for the cost of one ruggedized notebook.

As for PDAs, PocketPCs seem to have better displays, but a monochrome Palm-based device runs much longer and takes standard off-the-shelf batteries, so there's no fear of not being able to recharge while in the field. I also hear from colleagues that input accuracy is a common problem on PDA-based systems. The least expensive route is likely either scanned paper forms or a Web client on a PC that securely talks with a master database.

It's been my experience that the most advanced EMS agencies, from a data perspective, are those that have developed their own systems to meet their exact needs. Any time you buy an off-the-shelf package, even with customization, you're still going to have to modify the way you work and process information. For some agencies, this isn't a major issue, but it can be for some. Building your own data system is expensive, but in the end, you get what you want.

Wireless connectivity will become more pervasive and less expensive in the coming years, and this may shift the tide toward notebook or even tablet PCs and PDAs that are connected to a network or database server in real time. Hopefully, much of the medical monitoring gear will soon have wireless technology that will allow pulse ox readings, ECGs, BP readings and the like to be transmitted into a patient records section of

your notebook/tablet/PDA at the hospital to be stored forever as part of the patient record and to be immediately available for hospital staff. The IEEE 1073 Medical Interface protocol already exists that could allow such devices to interoperate. Wireless has become an IT community buzzword right now, but there are ongoing issues that must be addressed regarding security, coverage and cost.

I would love to hear your stories of what works for you, what has been a disaster for you and what you would like to see with regard to data collection. If I get enough responses, I'll compile the results and send them out to everyone who comments. Remember, you should also maintain a back-up documentation system, typically paper because of such emergencies as hurricanes, tornadoes, floods, wildfires and other disasters that may take your electronic systems off-line. I welcome your comments, criticisms, feedback and ideas. Contact me at ejems@cpcstech.com.

William Ott is president and chief consultant of CPCS Technologies, a N.C.-based technology consultancy providing services to the public safety and defense communities. He's been involved in EMS since 1981, in field, education and administrative capacities.