The Usefulness of Personal Digital Assistants for Health Care Providers Today and in the Future

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During the past few years, personal digital assistants (PDAs) have become hot commodities, similarly to desktop and laptop computers and cellular telephones. Many health care providers—physicians in particular—regularly use PDAs in their everyday work. In some countries, their use has approached the saturation level of 90%.[1] Only a fraction of those physicians who report that they use a PDA actually use it in medical practice, however—typically only 26 to 28% of physicians overall. We can infer that, like many busy people, physicians use PDAs' Microsoft Outlook-type functions outside clinical practice, for making personal appointments and using the calendar and contact information windows.

The questions I have been curious about for some time regarding the usefulness of PDAs in medical care are the ones I address in this editorial: For what purposes do health care providers use PDAs in their medical practice today? What potential uses of PDAs available in the near future will help clinicians to provide the best evidence-based care in today's demanding health care delivery climate?

In this issue of *Southern Medical Journal,* Torre and Wright[2] review the clinical and educational uses of PDAs. They satisfactorily answer my first question concerning the present uses of PDAs. In the patient care arena, they describe the three most important common clinical applications: access to inpatient and outpatient data, billing, and guideline- and clinical decision-based support tools, such as the downloadable American Academy of Pediatrics asthma guidelines (http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf).

In the area of medical education, Torre and Wright[2] describe the critical function of documenting the patient care activity of learners—an activity that has attained recent importance with the arrival of the new Accreditation Council for Graduate Medical Education's general competencies for residents.[3] At the core of these competencies is the documentation of outcomes, particularly accurate and complete tracking of learners' clinical experiences, which is a challenge for many graduate programs in the United States. In addition, three of the six competencies include the accessing of up-to-date scientific evidence as an important skill, which I discuss below.

Torre and Wright[2] briefly address the challenge of my second question—addressing the uses of PDAs in the near future—in their discussion of the concept of decision-making support and reference databases. This concept is often referred to as a *clinical decision-based support system* (CDSS) or a *clinical decision-based support* device (CDSD). CDSSs are usually defined as software systems that are designed to assist in clinical decision making with the use of updated databases of medical knowledge matched to a particular patient data set. These sorts of systems are a logical extension of technology to help clinicians overcome the medical information overload. First, they can facilitate or even automate reminders, test ordering, and drug dosing. Second, they can efficiently search for clinical data relevant to a particular patient. Third, the information can be delivered when it is needed the most: at or near the time of clinical decision making.

The next step in the evolution of CDSDs has been to deliver all this both at the point of care in a handheld computer using a best evidence model according to the theory and skills of evidence-based medicine.[4] It is known that providing the best evidence at the point of clinical decision making changes physicians' behavior. Sackett and Strauss[5] tested the use of an "evidence cart" during hospital rounds and demonstrated a marked increase in the use of evidence-based resources for clinical decision making when they were available while clinical decisions were being made. When the bulky cart was removed, the perceived need for evidence increased sharply but searching for it decreased dramatically. This study suggests that the need for best evidence models at the time of decision making is strong and that portable accessibility is critical.

A good example of an appropriate technological direction for PDAs is the InfoRetriever database (http://infopoems.com/; InfoPOEMS, Inc., Charlottesville, VA), a rapid-access CDSS for both PDAs and desktops. InfoRetriever contains the latest versions of the abstracts of the 1,646 Cochrane Systematic Review abstracts, 144 clinical decision rules, over 3,000 structured evidence appraisals often referred to as *critically appraised topics* (CATs)[6] gleaned from more than 100 of the most highly regarded medical journals and from other sources; evidence-based guidelines; 1,850 history and physical examination and diagnostic test calculators; and information regarding over 1,300 drugs. Most "hits" are attained in less than 30 seconds, a common time benchmark for clinical queries at the point of care. Clinical decision rules and examination and diagnostic test calculators are interactive

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evidence-based tools that use algorithms that assist with clinical decisions about individual patients with provider input.[7]

Within a few years, I would like to (and probably will) see CDSDs used as follows. Most clinicians will carry a wireless access PDA for all clinical encounters just as they do with their stethoscopes. Their PDAs will be connected wirelessly to medical information retrieval sites on the Internet. Retrieval times will be less than 30 seconds, and databases will be updated constantly with the most current medical information. In addition, most clinical questions will be answered in a concise, prevalidated format (less than one page); it will be a summary of the best evidence supporting the answer for the clinical question; and will have been prevalidated by an expert team and written in clinician-friendly language.

At that final step, it will be important to test this new model of accessing medical information with good research methods. It may be fast and it may be flashy, but I think everyone will want to know that it will change health care providers' behavior so that they will be better-informed and more effective clinicians as a result.

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