

PDA Interface

Creating the Digital Peripheral Brain

Bill G. Felkey* and Brent I. Fox†

Earlier installments in this series focused on PDA fundamentals: hardware, basic functions, software categories. This month, we begin a discussion of advanced clinical applications with an introduction to the Digital Peripheral Brain and its components. Questions or comments should be directed to Bill G. Felkey (felkebg@auburn.edu) or Brent I. Fox (foxbren@auburn.edu). Address mail to either author at Auburn University Harrison School of Pharmacy, Pharmacy Care Systems, 128 Miller Hall, Auburn University AL 36849-5506.

Integration is the key word these days when considering how to improve pharmacy practice through the use of information technology. We desperately need to move away from information “buckets” and “silos,” where important data resides in inaccessible locations. We need, instead, to bring the right information, at the right time, to the right person, in the right location. This describes the goal of the digital peripheral brain — to bring all the necessary resources to bear on a problem whenever and wherever that problem arises. To accomplish this goal, we see the increasing implementation of point-of-care technology and infrastructure.

One application of point-of-care technology is the use of PDAs to display patient information. Some people believe that the PDA does not have a large enough screen to display a readable synopsis of a patient's electronic medical record at the bedside. To remedy this, a wireless workstation with a

larger screen has been devised for use at the patient bedside. A comprehensive version of the medical record can be downloaded from this workstation to the PDA so that pharmacists and physicians have salient data for decision-making wherever they are located.

Our challenge is to maximize the integration of the PDA into every aspect of practice where it might enhance the efficiency and effectiveness of the practitioner. We have tried to imagine all the ways that PDAs can or could be used, so that it can become the best tool possible. However, it is possible that PDAs could be overused, that is, if they lead professional users to become complacent and not exercise their best professional judgment in clinical decision-making. As faculty members, we especially want our students to use these devices appropriately. We can say with great confidence, however, that the PDA has a huge potential capacity to assist us within the categories listed below.

PERSONAL INFORMATION MANAGEMENT

The core applications that come

preinstalled on all PDAs allow professionals to manage their time in the most efficient way possible. Functions that allow one to schedule appointments and other “committed time” and request alarms and repeat scheduling are powerful features, because most health care professionals are driven primarily by time constraints. Discretionary time can be structured with prioritized task lists (“To Do” lists) that remind us to put critically important duties first.

We all work in interdisciplinary teams and the organization of our professional and personal contacts can allow us to collaborate readily with our colleagues. To overcome the limits of human memory, we can use the Notes feature of our PDAs to capture specifications and detailed pearls of wisdom that aid us in decision making. Personal information management is fundamental to PDA infrastructure and to clinical implementation of the device.

COMPENDIA

Nearly every professional tertiary reference has produced a PDA application. Given the memory capacity of the most recent PDAs, professionals can carry an entire library shelf of references with them wherever they practice. These references include comprehensive monographs on topics such as disease states, drug therapy, nondrug therapy, laboratory tests, and alternative medicine.

Publishers have begun to link references within their own collections and even to the collections of other publishers. Intelligence is built into these references, so that customization according

*Associate Professor, †Informatics Research Associate: Auburn University, Department of Pharmacy Care Systems

to personal preference or a formulary-specific format is possible. Updating has moved from quarterly, to monthly, to daily updates of the best products.

Products are even including professional news, issues, and alerts with their information products. Qualitatively, pharmacists are able to purchase complete books (prose style), more granular or information (outline or synopsis approach), or "lite" (abbreviated) versions.

CALCULATORS AND CONVERTERS

Your digital peripheral brain will also include applications that help you perform the various calculations required in the practice of your professional specialty. The best products carry a comprehensive list of calculations but also allow you to add your own formulas to the application. Several good pharmacokinetic applications are available. Some pharmacists use a PDA version of a spreadsheet so that they can carry a customized set of calculations with them. Applications that convert between the standard scientific units of measure are also valuable to practitioners.

DOCUMENTATION AND TRACKING

Applications in this category have a huge potential for improving health care practice, but are held back by the lack of integration in information systems. There are many fine electronic medical records for the PDA, but only a few are capable of prepopulating these records with patient data so that the most expensive health professionals in an organization do not become data-entry clerks.

Included in this category are order-entry applications, which will probably precede electronic medical records in their order of implementation within health systems. We believe that this move will occur out of

sequence, with the potential for less-than-desirable results from order entry, because many data holes that compromise patient safety exist in order-entry systems. In our opinion, doing order entry from a comprehensive electronic medical record (already in place) is much preferable.

You have heard the expression, "If you didn't document it, you didn't do it." Pharmacists have significant value to health systems when they intervene in pharmacotherapy decisions. Many fine intervention-tracking programs that document the value of pharmacists in patient care settings are being added to the market. The best of these uses a combination of Web browsers and PDAs to capture interventions and manage the reporting of these interventions on a system-wide basis. Benchmarking of data and comparisons between institutions will also be possible in the near future.

Helping patients become self-care managers is a worthy effort. There are many PDA-based patient logs that stimulate and record patient data. The incorporation of patient monitoring and tracking applications is only now becoming possible due to the proliferation of PDAs within the general population. While this should not be the highest priority of a practice, significant improvement in patient outcomes will be realized using this category of application in the future.

PRACTICE GUIDELINES

Bringing high-quality evidence to all aspects of patient care is a mission-critical priority. An incredible richness of information — in the form of practice guidelines, clinical protocols, clinical pearls, and algorithms — supports clinical decision-making. The appropriate use of drugs and medical procedures is well covered in the literature; these published resources are easily stored

on a PDA. Guidelines focus on both patient and condition-specific needs. There is even a growing number of population-based guidelines from which to choose.

PATIENT EDUCATION

Patient education is another area in which the capability of the PDA is growing growing. Patients fail in a regimen because they don't know what to do, they don't know how to do it, or they are not motivated. Drug-oriented and disease-oriented leaflets are becoming available for the PDA. The infrared beam of the PDA would allow an "on demand" printing of these materials (using an infrared printer). Instead of keeping a filing cabinet full of patient information sheets, a pharmacist could generate customized materials for discharge consultations on an as-needed basis.

We know that patients learn best by visual means and that the quality of the PDA display screen has improved; thus multimedia assets may be incorporated into patient education at the point of care. Resources that help patients make lifestyle changes, such as smoking cessation and weight reduction, are available for the PDA. Specific tools that motivate patients to adhere to their medication and lifestyle-modification regimens are also widely available.

UTILITIES AND DOCUMENT MANAGEMENT

Not all point-of-care resources exist in application formats. A variety of document management suites give the practitioner both read and write access to documents such as review articles and spreadsheets. PDAs can now support PowerPoint presentations, e-mail management, and photo collections.

Other options include system utilities that can optimize PDA memory and expansion memory. Tools such as word completers allow rapid data entry

to maximize efficiency. These tools will also allow the importing of a customized dictionary of specialized terms.

CLASSIFICATION AND CODING

Resources that assist in identifying the appropriate International Classification of Disease category provided the ability to accurately label conditions. In addition to documenting interventions, tools that allow the appropriate assignment of procedural codes and the automation of evaluation and management billing for cognitive services are available. Again, many of these applications link to other applications, facilitating the rapid processing of reimbursement claims.

APPRAISAL

In the clinical process that includes appraisal, intervention, evaluation, monitoring, and follow-up, the ability to perform a comprehensive patient workup is

important to ensure positive outcomes. Applications within this category assist in the performance of differential diagnosis using evidence-based, medicine-derived tables. Signs and symptoms associated with various conditions can be assessed interactively and provide statistical confidence levels on suggested diagnoses. This category of software can also assist in staging patients within conditions.

CONCLUSION

We can safely say that we do not have a problem determining if a particular technology for the PDA exists. The more difficult question is, which of the available products is of the highest quality and utility? After determining "best of breed" applications, we must then choose the products that best suit our workflow and work load.

Most of us stop after getting only 10% to 20% of the available power and capability from our information technolo-

gy. We advise PDA users to tap into the other 80%, and maximize the value of this important resource for your organization and your own practice.