
Implementation of a Computer Database Testing and Analysis Program

Use of NIDSEC-Compliant CIS in Community-Based Nursing-Directed Prenatal Care to Determine Support of Nursing Minimum Data Set Objectives

Nurses’ Experiences Using a Nursing Information System: Early Stage of Technology Implementation

Strategy Development for the Implementation of Telenursing in Korea

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Don’t Go To Work Without Your Backup Brain!
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Key Points:
- Varieties of Handheld Tools
- Clinical Tools
- Resources

A few years ago I was stopped by the unit manager of a unit on which I was working. It seems that she was bothered that I was not interested in providing patient care, but seemed more interested in “playing computer games.” I think my face must have involuntarily gone into some sort of “huh?” look because she pointed at my waist and said, “You shouldn’t play with that, that computer thing in front of people.” She had no idea what the personal digital assistant (PDA) clipped to my scrubs was or how it could be used to help me provide patient care and education.

Thankfully, I had the chance to educate the unit manager and the rest of the staff on how I was using my PDA as a valued reference and patient education tool. These days, most nurses simply ask me if I brought my “backup brain” with me to work. Sadly, they mean the PDA.

Currently, the PDA goes by any variety of names. Actually, “PDA” or “personal digital assistant” is an “oldie.” You also find it referred to as a “handheld,” pocket PC, or smartphone, and even sometimes by its brand name such as Treo or Palm. The growing trend these days is to call the PDA a “handheld device” because it has become so much more than a personal digital assistant.

Simply stated, the PDA or handheld device of today is something you can hold in your hand, has a long-life battery, and offers to make your job (and one would hope, life) less complicated. Hopefully, this article will help with the “less complicated” part.

When you use a PDA while providing clinical care, you have a remarkable resource in your hand. The fact that you can make a rather simple investment in a tool that will provide you with on-the-spot and up-to-date detailed references, illustrations, and patient education materials is rather remarkable. (Don’t forget to check with your tax person; this investment is often tax deductible.) No longer do you have to look all around for that tattered old drug reference or the half complete copy of the medical physiology reference. Your PDA will be by your side at all times offering you, your patient, and the patient’s family immediate and accurate references when needed.

Most of us have heard about some of the basic drug reference tools such as Epocrates RX (Epocrates, San Mateo, CA), but there is so much more for which we all can use the PDA. Let’s examine options for your use of the PDA in your clinical care role.

A SIMPLE START

The obvious first choice is simply keeping track of your calendar and contacts (Figure 1). The internal calendar and contact feature makes that easy. You have the ability to synchronize your PDA with any number of computer-based calendars and contact programs. If you use an e-mail client such as Microsoft Outlook (Microsoft, Redmond, WA) or a Web mail account such as Yahoo mail (Yahoo, Sunnyvale, CA) or just want to use the PDA’s own computer calendar and contact program, you will have an electronic copy of your information on your PDA and your home computer. With the right tools, you can even share that calendar with your family and friends over the Web. Synchronize your PDA with your Web mail account, and you can instantly have your calendar available to everyone or people you choose. (Don’t worry about privacy; you can just set Yahoo to show “busy” on the
Web page instead of “sleeping off a night shift.”) The next time your friends want to know when you are off, just tell them to check your Web calendar.

What about tools to help you with your productivity at work? As a nurse, you always have a few hundred tasks to accomplish in any given minute. We all pride ourselves on our ability to multitask, but we also never turn down a little help. What if you had someone who followed you around and reminded you that it’s time to bring Mr. Smith for a computed tomography (CT) scan, or that Ms. Williams needs blood drawn for a new complete blood count at the top of the hour. That is what BugMe! Notepad (Electric Pocket Ltd, Wye Valley, UK; www.electricpocket.com) is designed to do. Think of it as a sticky note with an alarm clock built into each note. All you need to do is start up the program, write something like “CT Rm 4 @ 1630” on the screen (Figure 2), and set the alarm, and it will ring, popping up the note when the alarm goes off. You can even set it to be really annoying and keep ringing till you hit the “snooze” button. Set as many reminders during your shift as you wish. Now you can get bugged by BugMe instead of the call bell and your phone, and have no more sticky notes on your charts, tape on your scrubs, or string around your finger. With such a simple tool to help you be more efficient, who knows what it could even help improve patient satisfaction scores.

What about the real clinical tools you can use on your PDA? That’s really where a PDA in the clinical setting can shine. Sooner or later most of us want a little help with our job. Think about how a series of references at your fingertips would help you do your job smarter and safer.

Each of us relies on a basic nursing foundation, and then we build on that according to our specialty. The good news is that no matter what your clinical specialty, there are a few clinical references you can put on your PDA. Sooner or later all of us consider looking something up during our shifts. Sometimes we do it, and sometimes we don’t. Typically, reason has something to do with the lack of ease with which we can get the information. But with a PDA, you can carry drug references, medical encyclopedias, lab reference manuals, clinical specialty sources (eg, oncology, critical care, emergency, obstetrics, geriatrics) and so much more in your pocket, on your waist, or wherever you put it.

So where do you start? Most nurses start with a drug reference such as the free version of Epocrates RX or Davis Drug Guide for Nurses (available from any number of vendors). The problem is that we tend always to need more than just the drug reference. The other option is to buy multiple references from one (or many) different vendors. A company such as Skyscape, Marlborough, MA, offers a large list of reference texts. Many of the printed books you use currently can be purchased for your PDA through a company such as Skyscape, and they typically cost a little less than the printed edition (and are updated on a quarterly schedule—usually).

Most nurses prefer to buy a product that is fully integrated with a variety of data and features and one that meets a variety of clinical information needs based on their clinical specialty. Some vendors try to accomplish this by providing a common menu for multiple references or by cross-referencing the content of one reference book with another. PEPID (PEPID Medical Information Services, Inc, Chicago, IL) has a diverse content product and has content focused on specific specialties (Figure 3). The PEPID service has an annual subscription cost dependent on specialty. Because we ultimately want and need more than just a drug reference, PEPID has drug references with nursing considerations,
drug interaction lists, a huge list of medical calculators (from simple med math to complex critical care calculations), and a variety of pathophysiology and diagnostic content directly integrated into one application. In addition, any content PEPI adds throughout the year is included in your annual subscription at no additional cost (not always the case with other products). Because PEPI is a number of references rolled into one, it is a lot easier to operate and ultimately cheaper than buying all the materials separately. The master index can be a little daunting with all the information PEPI offers, but it is worth it to have all the information in one location.

After you have your basic application, such as PEPI or just a simple drug reference, you should start to consider other references you need to make doing your job easier. For example, perhaps you like having a comprehensive medical dictionary or encyclopedia available such as Taber’s (Figure 4). If you are someone who likes to dig into the details, maybe you want a lab reference, a copy of the 5-Minute Clinical Consult, or some of your favorite critical care texts. Just about any printed reference book you could use in the clinical care process is already available in PDA form. Some, however, do not include all the images, or they format the book in a plain format. A few companies specialize in offering them in a variety of layouts. The good news is that all these companies let you download and install them in “trial mode” for a specified period so you can see whether you want to buy them. Although the trial download includes the entire text, it may lock you out of specific content until you buy and register the company’s product.

It is worth looking at a trial version because some companies do a better job formatting for the PDA screen. Companies such as SkyScapes (www.skyscapes.com), Medical Wizards (www.medicalwizards.com), PDA Cortex (www.pdacortex.com), and others offer trial versions for a variety of medical reference texts in PDA format at their Web sites. As you begin to be familiar with how your PDA works, you will want to start building your PDA library.

![Figure 4. PDA version of Taber’s Medical Dictionary.](image)

**PDA FOR PATIENT EDUCATION**

Have you ever sat down with a patient and tried to explain the anatomy of the heart, exactly where an ischial tuberosity fracture is located, or a renal stone distal to the renal pelvis is? If you are like most nurses, you certainly cannot draw it (stick figures do not have an ischial anything). Besides, why draw it when you can let your PDA do the talking for you. There are a variety of reference applications on the

![Figure 5. Medical Wizard Flash Card.](image)
market that work well for patient education. Medical Wizards, Redmond, WA, has a wonderful list of anatomy flash cards, for example. You can buy a very detailed and large list of the entire body or buy on the basis of some subcategories. At the time of writing, prices ranged from about $15 for the respiratory system to $120 for the entire body collection. The quality of the illustrations on your PDA are remarkable for the screen size (Figure 5). There are any number of other education options for your PDA.

Depending on your creativity, you can do many things in the clinical setting with your PDA without buying more applications. You can save images or even a short video to your PDA for use with patients and colleagues. You need only use something such as a Google image search on your computer, save the image to your computer, and transfer it to your PDA. Be aware of copyright restrictions on each image and, if necessary, contact the copyright owner for permission to use the materials. The images in your PDA can be very helpful if you work in a specialty unit that tends to have the same patient care regimens.

All these patient education tools are remarkable, but because the PDA has a small screen, the 90-year-old patient with limited vision is not the best candidate to see a picture on the PDA. Pediatric patients really appreciate the PDA as an education tool. You can even load a few video cartoons on the PDA to help distract the kids when you do a procedure. Just do not let them hold it. Ask Mom or someone else to hold it. One temper tantrum taught me how far a PDA can fly. I still learn by my mistakes.

Perhaps the most helpful personalized touch with the PDA involves developing your own information sheets and storing them on your PDA. A few shortcuts from your menus allow you to open a wealth of personalized knowledge in a second. It's hard enough to remember what you are doing in the one unit where you work, but as you are floated to other units or work in multiple hospitals, personalized information sheets will help keep you from making mistakes.

You can create templates for things such as how specific units and physicians like their charts or reports prepared, or any of their protocols (Figure 6). To create these, you can use the notes feature in the PDA or create the file on your computer and save it as either a Microsoft Word or Adobe PDF file (Adobe Systems, San Jose, CA), which can be imported to your PDA. Other sources of information that you can place on your PDA include hospital phone directories, highlights of internal policies and procedures, and hospital or other clinical guidelines. Some hospitals are putting their policy and guidelines documents on their network which, if the hospital and your PDA have wireless Internet access, can be accessed on your PDA while you are at work.

Essentially, the options of what you can put on your PDA are endless. It takes only a bit of creativity and research to find some great tools on the Web. A head start for you can be found with companies such as

- **PEPID** (www.pepid.com), which offers single-source, well-integrated reference applications.
- **Skyscape** (www.skyscape.com), which has numerous individual reference books that you probably have used in print. Some have been integrated into packages with a common menu and some inline cross-references.
- **Handango,** Hurst, TX (www.handango.com), a large store with all types of nonmedical and medical applications for PDAs. This site offers the option to set up an account that specifies the model of PDA you have. Then you will be offered only applications that will work on your device.

Sites such as Handango make it possible for you to get creative with how you use your PDA. You can buy applications that will help you keep track of your work hours, your personal medical information, your diet, and a list of games to use anywhere...except at work, of course.

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**EQUIPMENT SELECTION**

So, now what? You have seen that a PDA can do more than store some phone numbers and a list of drugs. Now you need to figure out what PDA device is right for you. Like any other electronic tool, there are a few choices on the market. You need to answer some simple questions as a help in making a decision.
Perhaps the first question to ask yourself is do you want a stand-alone unit (PDA only), or are you looking for a device that can be your phone, a PDA, and maybe even a device for accessing your e-mail and the Internet? Going the “PDA-only” route narrows your product choices. It’s a shrinking market segment, and the two remaining big players in the market are Palm, Sunnyvale, CA (www.palm.com) and Hewlett Packard Company, Palo Alto, CA (www.hp.com). The advantage of PDA-only is that when you are not using it, you can leave it at home. However, once their schedule, phone numbers, and the like are in it, most people start realizing that the PDA is an integral part of their daily life and end up carrying both a phone and PDA all the time.

That brings us to the integrated PDA phone or “smartphone.” The smartphone is essentially a PDA and phone combined. Because you usually buy one from your cellular carrier, you can start by determining what they offer. However, there is a catch. Some things that “act” like a smartphone will not run most of the applications on the market. For example, a Motorola Q is very small and sleek (Motorola, Schaumberg, IL). It is a smartphone, but it runs a streamlined version of the Windows Mobile 5.0 operating system. Currently, it will not run many of the applications mentioned in this article. However, vendors are working to enable their applications to run on some of these newer devices.

Currently, it can be costly, not to mention bulky, to have both a phone and a PDA. At the time of writing, the PDA-only devices cost from $200 to $600. A PDA phone actually costs the same, but it is at least one less device to carry around, and the smartphone is a growing market trend.

In choosing a PDA phone, your safest bet is to go with the more mainstream products. The most common lines of products that work well with all sorts of applications are the Palm Treo (Figure 7) and some of the HP iPAQ line. If you recently upgraded your cell phone, you may have to pay a premium to upgrade again, but if you talk to the sales agent at the store, you may get some credit. For the worst case, talk to your tax person; the cost may be deductible. If you are not planning to use one of the mainstream Treo or iPAQ devices, check with the application vendors you are thinking of using to see whether they support the product before you invest in the device. One thought on the product line called the “Blackberry”—the newer models will allow you to install applications, but only a few application vendors support this type of PDA. PEPID and a few others do have versions of their applications that will work on a Blackberry, but the list currently is small.

There are some other advantages to going with an integrated phone PDA device. If you are willing to pay your cellular phone provider more, you can also have high-speed Internet access on your phone (Figure 8). This gives you access to e-mail and the Web from just about anywhere. That’s a nice plus for some of us who like to be “ultra in touch with the world.” If you are the type of nurse who likes to hide from the world on your day off, stay clear of this option. Web browsing over your phone does not offer the best screen layout, but it is a “nice to have” for some functions. Some folks really get hooked on their e-mail with the smartphone. In fact, the Blackberry device, which was the first in the market to have a well-integrated e-mail solution, is often called a “crackberry” for that very reason. Another advantage

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**Figure 7.** Palm Treo Smart Phone. Used with permission

**Figure 8.** Internet Explorer on PDA. Used with permission.
of Internet access is that you can synchronize all your contacts and other references from the Internet and even remotely update many of your applications, all without ever connecting to your computer.

**CHOOSING AN OPERATING SYSTEM**

The next question you need to ask yourself is whether you want a PDA that is a Windows- or Palm-based operating system. Think of this as the difference between Apple’s Macintosh OS and Microsoft Windows, without the funny commercials. All the products discussed in this article are available for Palm and Windows so this is not much of an issue (although when you buy, you do need to make sure you are offered the right version, and that you download the right version—Windows or Palm). Palm used to be the only player in the market worth taking about, but the industry trend is moving away from Palm toward the Windows market.

How do you choose? Palm is easier to work with and in some cases faster. Windows is more like your home PC, offering some more advanced functions and better integration with your home PC. Either way, I strongly encourage you to get a device with a keyboard and a place for an expansion card (typically called a Secure Digital Memory or “SD” card), such as a device in the Treo line (available in Windows and Palm versions). The keyboards are small, but their use tends to be easier than learning how to use a stylus to “write” a short cut of the letter. The expansion card will enable you to store more on the device than if you just use the internal memory. It is a must if you are going to run more than one application because many of the models do not have a lot of internal storage space for these applications.

How do you decide? As you have read, a lot of options exist. Perhaps the easiest way is to ask your friends what they use and what they like. Most importantly, ask them if they will help you when you get yours. You cannot beat personal “tech support.” Help also can be obtained by joining the PDA listserv from PDA Cortex (www.rnpalm.com/nursing_pdas_listserv.htm) or by relying on the support services from the phone and application vendors mentioned in this article.

**PDA FUTURE**

Where is the PDA market going next? Product managers from the various big vendors all have big plans, but will not allow them to be announced to the public yet. However, it is safe to say that the technology is here, and we are going to start seeing some remarkable integration in the future that will benefit nurses. Already, there are vendors who offer a variety of tools for reviewing and confirming various elements of an electroni-