

# 1° Care Exchange

A Reader-Directed Journal from the Oklahoma Center for Family Medicine  
Research at The University of Oklahoma Health Sciences Center

Volume 2, Number 1

Spring 2000

## In this issue...

### Electronic Medical Records

#### Editorial Staff

##### Editor-in-Chief:

Laine McCarthy, MLIS  
laine-mccarthy@ouhsc.edu

##### Managing Editor:

Lavonne Wolfe-Glover  
lavonne-wolfe@ouhsc.edu

#### Published by the

Oklahoma Center for Family  
Medicine Research

Department of Family &  
Preventive Medicine,  
The University of Oklahoma  
Health Sciences Center  
900 NE 10th St.  
Oklahoma City, OK 73104-5499  
(405) 271-2370

#### Also on the Web

<http://www.fammed.ouhsc.edu>

*Funding provided by*

The Oklahoma Academy of  
Family Physicians

## Next Issue:

Diets: Fads, Facts  
and Fallacies

## Electronic Medical Records: Answers to Your Questions

By Jim Cacy, Ph.D., and Terry Truong, MD

An Electronic Medical Record (EMR) makes it possible to enter, store and retrieve patient data quickly and in a variety of formats. This science is rapidly evolving beyond data management to include interaction with other programs that enhance patient care and information retrieval. There are currently over 300 EMR vendors. Some offer integrated billing and scheduling programs; some do not. Some offer either custom programming or pre-programmed interfaces for certain existing billing and scheduling programs. There are three tiers of vendors separated by cost and scale. Cost ranges from approximately \$350 to \$5,000 per physician.

Confused? In the pages that follow, we will try to answer some of your questions about EMRs so that you will be better informed as you enter the world of electronic medical records.

### EMRs: Answers to 10 of Your Questions

1. What are the median and range of costs per physician for purchase of EMR software? Give examples of low, middle and high-end products.

According to a recent survey by the American Academy of Family Physicians (AAFP), estimated system costs for an office with one health care provider and five workstations (e.g., three exam rooms, front desk, and nursing station) can range from \$8,500 to \$70,000. However, 17 of the 28 vendors polled did not provide cost information (Ornstein SM et al. Computerized Record Systems: A Survey of 28 Vendors. Family Practice Management, Nov/Dec 1997). Furthermore, it is not clear from the article what was included in the estimate. Some vendors may have included training and hardware; others may have been estimating only the purchase price of the software. Finally, please note that this survey included only 28 vendors, and current estimates of vendors offering EMR products range upwards of 300 or more.

The least expensive of the vendors cited in the survey, at least of those reporting cost, was Infinity Medical Record System by Infinity Medical Systems (\$8,500). The most expensive was NextGen by Clintec International (\$70,000). No estimates of incremental costs for additional providers and workstations were included. Table 1 below provides costs and product comparisons for 11 EMR vendors.

*(Continued inside)*

#### About the Authors

**Jim Cacy**, Ph.D., is instructor and director of Information Services with the Department of Family Medicine at the University of Oklahoma College of Medicine.

**Terry Truong**, MD, is a private family practitioner in Mangum, Oklahoma.

## Table 1: Product Chart

Product	Vendor	1 provider/ 5 workstations	8 providers/ 40 workstations
Berdy Smart Clinic	Berdy Medical Systems	\$15,000	\$120,000
ChartWare	ChartWare	\$15,000	\$117,500
Clinical Master	Clinical NetwoRx	\$26,000	\$184,600
The Doctor's C.E.O.	The Magic Corporation	\$20,000	\$77,000
Dossier of Clinical Information	Purkinje International	\$21,195	\$129,478
Health Probe Patient Information Manager	Healthcare Data	\$10,000	Not given
Infinity Medical Record System	Infinity Medical Systems	\$8,500	\$55,000
NextGen	Clintec International	\$70,000	\$280,000
PAL/MED	PAL/MED Services	\$55,000	\$250,000
Practice Partner Patient Records	Physician Micro Systems	\$25,000	\$150,000
Stat*Pack	A*A Data	\$18,000	Not given

### EMRs: Answers to 10 of Your Questions (Continued)

Most EMR vendors have Web sites, but few if any list pricing on the Web. An interesting exception is SOAPware by Docs, Inc. The basic EMR software for one provider is \$300, with additional modules available as add-ons. For approximately \$1,800, one provider can purchase the entire suite. To compare to pricing listed above, a total system for one provider and five workstations could cost as little as \$6,800.

### 2. What are the various components available for EMRs (e.g., billing, appointment scheduling, prescriptions, etc.) that are generally considered as extra/added features and cost additional dollars. What are the median and range of costs for these special features?

The survey cited earlier did not address this question and, as noted, cost information is difficult to obtain from EMR vendors. With regard to what is included with the base package and what is additional, this question needs to be addressed with the vendor when the salesperson comes to visit. Examination of numerous Web sites indicates that there are almost as many ways of structuring systems as there are vendors.

Billing and scheduling tend to be included together in a package separate from the EMR package. Various others features, such as health maintenance reminders, formularies, drug reference information, and document scanning, may be available from some vendors, at additional cost.

### 3. What are the median and range of costs per physician for the purchase of hardware for an EMR?

The hardware for an EMR must be discussed in the context of the operating system software. The ubiquitous PC frequently is provided with some version of Microsoft Windows installed. Windows 98 will cost about \$200 extra per machine if it is not included in the hardware purchase price. Similarly, many PCs designed specifically for use as servers may come with the operating system installed, but most do not, and Windows server software is quite expensive (see below).

Assuming that the EMR runs on commonly available PC computers and networking equipment, each workstation can cost as little as \$1,000, including operating system software (i.e., Windows 95/98). Some software runs on what is called "peer-to-peer" networks, which means that one of the workstations contains the master database and all other workstations share that database. Some systems require a server running a network operating system, such as Windows NT or Windows 2000 Server (approximately \$1,000 for server and five workstation licenses). The server computer itself for five workstations could cost as little as \$3,000, but \$5,000 is more realistic (more storage capacity, back-up device and software, more system memory, etc.). The network requires a hub and cabling to connect the workstations to the server. A small workgroup hub can cost as little as \$100, and cabling can run more than \$200 per machine.

#### 4. What are the median and range of costs of training? For conversion of old records?

Some vendors include training and require that you receive it; others simply sell you the software and manuals. Hiring a consultant to provide training can run \$500 per day per consultant or more. Hiring a programmer to convert old records can be equally as high (\$500/day). However, if your old vendor is uncooperative in helping with the conversion to a competitor's system (which is likely to be the case), conversion costs can soar because you have to pay both the old vendor and a programmer to complete the conversion. These are both questions worth asking up front during your negotiation process.

#### 5. What are the median and range of annual projected costs of operating an EMR (software service contract, software and hardware upgrades, other)?

Answering this question will most likely require sitting through sales presentations by the more than 300 EMR vendors. We have had experience with two.

*Medicalogic*, Inc. is one of the higher-end vendors and arguably one of the best. However, in addition to substantial up-front costs, annual fees can also be quite substantial. A recent quote provided to one department at the University of Oklahoma Health Sciences Center for 33 residents and 10 attending physicians indicates that yearly fees may run as much as \$38,900. Remember, this figure does not include any of the initial hardware or software but indicates only the projected annual operating expenses.

In comparison, **SOAPware** would cost \$12,000 in yearly fees for continued support for the same number of providers.

#### 6. In what areas can a practice expect to realize cost savings as a result of an EMR? Estimate the amounts of potential cost savings in each area.

A practice should not expect to achieve substantial cost savings by going to an EMR. Rather, returns are likely to be more efficient and accurate billing, with the possibility of increased revenue flow by reducing defensive down-coding. The practice may realize some savings by reducing the number of clerical staff handling charts. If providers are willing to type chart notes or use voice recognition there may be savings in transcription charges. But the real benefit of an EMR is having detailed patient data in electronic form, which makes information access far more efficient, provides the ability to locate specific patients quickly (e.g., in the case of a drug recall), and lays a foundation for electronic data exchange with pharmacies, labs, consultants, and even selected patients.

#### 7. In what areas/ways can a practice expect to increase productivity as a result of an EMR?

Estimate the amounts of additional revenue in each area/way.

Some EMRs provide helpful clinical assistance features, such as health maintenance reminders and drug interaction warnings. Some even provide assistance for more accurate E&M coding. EMRs have the potential to decrease defensive down-coding, which can in turn increase revenue. Additionally, using EMR features that allow the physician to quickly note routine observations that might normally be overlooked during dictation (e.g., a pen-based check-off system to record preventive health care issues discussed during a routine exam) might lead to higher average coding that is easily defensible in Health Care Financing Administration (HCFA) audits or insurance company challenges.

#### 8. Describe some of the differences and similarities between EMRs as a basis for trying to select one over another.

An EMR is basically a database program, which means that it contains a structured means of storing and retrieving information, such as a patient's name, medical record number, demographic information, and information gathered at each encounter. Most modern database programs use what is called a "relational" design, which is more or less standardized and understandable to most computer professionals. Older systems may use a less-efficient "hierarchical" design or even a proprietary design that is understood only by the vendor's developers. Systems using a relational design are currently preferable.

Any EMR will allow you to enter information about the patient and then search for it later. As always, the devil is in the details. Differences involve ease of use, intuitiveness, types of fields (e.g., restricted selections for each field versus free-form that allows you to enter whatever comes to mind), and features such as assistance with E&M coding, warnings of drug interactions, health maintenance reminders, patient education materials, remote access, and hundreds of other features limited only by the imagination.

**9. How should one prepare for dealing with EMR sales people?**

Caveat emptor! Buyer beware! You should approach an EMR like you approach the purchase of anything else that can cost this kind of money. Insist on getting your hands on the product to try it yourself, just as you would insist on driving a car before you buy it. Talk to others who are using the product you are considering and visit them, if at all possible, just as you would ask friends about a car or a particular dealer's reputation. Get a list of clients from the vendor. If they are hesitant to share this information with you (or unhappy that you asked!), beware. Don't limit your investigations to just one or even two vendors. Comparison shop, ask about features, ask about add-ons, look

for hidden costs. The sales reps are going to demonstrate their highest end products with all the bells and whistles to entice you (just like the car dealer!). Be sure to ask about the cost of each feature (such as drug-drug interaction databases, formularies, pharmacy and lab links). The last thing you want is to be surprised. Competition is fierce out there. Let that work in your favor.

**10. List several recommendations of representative EMR programs with names, addresses, phone numbers.**

See Table 2, below.

**Table 2. List of Six Representative Electronic Medical Records Vendors**

<p><b>Practice Partner</b>            Physician Micro Systems, Inc.            2033 6th Avenue            Seattle, WA 98121            800-770-7674            206-441-8490 (voice)            260-441-8915 (fax)  <a href="http://www.pmsi.com">http://www.pmsi.com</a></p>	<p><b>SOAPware</b>            DOCS, Inc.            1443 W. Sunset            Springdale, AR 72764            (501) 750-3606            (800) 455-SOAP (7627)            FAX: (501) 756-0283  <a href="http://www.docs.com">http://www.docs.com</a></p>
<p><b>Practice Studio</b>            MicroFour, Inc.            734 North Taylor            Amarillo, TX 79107            800-235-1856  <a href="http://www.micro4.com/">http://www.micro4.com/</a></p>	<p><b>MedicalLogic</b>            20500 NW Evergreen Parkway            Hillsboro, OR 97124            800.322.5538            503.531.7000            503.531.7001 (fax)  <a href="http://www.medicallogic.com/">http://www.medicallogic.com/</a></p>
<p><b>Welford Chart Notes</b>            Welford Medical Computing, Inc.            3779 Hermitage Trail            Rockford, IL 61114            Contact: MEDCOM Information Systems, Inc.            Hoffman Estates, Illinois            847-885-1553            847-885-1591 (fax)  <a href="http://www.ios.com/%7Emedcom19/medcom.html">http://www.ios.com/%7Emedcom19/medcom.html</a></p>	<p><b>Physix, Inc.</b>            2 E. Greenway Plaza #610            Houston, TX 77046            (713)797-1199            (800)749-2585            (713)794-0855 (fax)  <a href="http://www.physix.com/">http://www.physix.com/</a></p>

## Implementation of an Electronic Medical Record

Implementing an electronic medical record involves careful planning. Pre-implementation preparation should include physician and staff training on utilization of the program and its back-up system; strategies on data entry, storage, retrieval; and back-up. Adequate proactive physician and staff training to achieve program familiarity translates to a higher chance of a successful transition. Staff training will require some after-hours sessions. Creating mock patient accounts will allow practice of data entry, retrieval, and maintenance. This practice permits user-evaluation of the system and program. In turn, a decision on whether to convert old medical records, and billing records if applicable, will become clear.

Alternatively, the program may be used only on a few patients daily, concurrent to the practice's current system, with printing and filing of the encounter notes in the paper charts. This scenario enhances staff familiarity and proficiency with the program, and more realistically discovers the strengths and limitations of the

EMR program. Data entry, management and retrieval strategies should be clear prior to implementation. Previous medical records' maintenance and conversion, and billing records if applicable, should be considered carefully.

During the initial training period, staff members should try solving problems of program failure, and power failure. This process will allow drafting of a sound strategy to handle with such crises. Program failure, for example, may be efficiently dealt with simply by maintaining a papered chart, or another computer loaded with the same EMR program. Power failure solution may include power surge protectors, external batteries, and an external power source such as a power generator.

The AAFP has published an excellent booklet about electronic medical records systems. "How to Select a Computer System for a Family Physician's Office," by Susan Rhem, MBA, and Susan Kraft, MD, is available from AAFP for \$10. Call 1-800-274-2230 to purchase this book.

## Practical Issues

The EMR program should suit the intended use, and achieve the goals of the users. Selection of an EMR program should involve all staff who will potentially use the program. System requirements, maintenance and compatibility, technical support, and program maintenance and upgrade must be clear prior to the purchase.

- It is possible to use the EMR as an assistive device to organize patient data that is then printed as a paper chart.
- Until voice recognition software becomes available, it will be difficult (but not impossible if you type fast or love templates) to get by without a transcriptionist.
- Plan to spend at least \$500 - \$1,000 per year for technical support and upgrades.
- Budget funds to replace hardware every 3 - 4 years.

## Backup and Security

There should be back-up systems at two levels. One maintains and stores another copy of the information contained in the EMR program. The other allows all office activities to proceed smoothly in case of program failure due either to software/hardware problems or even power failure to the area (i.e., a paper back-up system). All back-up systems should be reliable and easily accessible to all office personnel. Finally, as with conventional paper charts, patient confidentiality must be protected through an effective security system and sound office policy. Additionally, there should be a back-up copy of the program's data. This copy may be kept off-site, protecting valuable information in case of a fire or other disasters. Some EMR programs are totally inaccessible during the back-up process, and thus restrict the back-up to after-hours only. This requires the presence of a staff member to remove the produced copy. It may also limit the accessibility of the program via phone line from a physician's home in the event of an emergency room patient or an inpatient.

For more information about Electronic Medical Records, please contact Dr. Cacy at 405-271-8000, Ext. 3-2109.

# New and Cool for Palm-tops

## New Palm Hits the Scene

Fasten your seat belts. This market is in a frenzy, and the bar will be raised again sometime in June, 2000, when the TRGPro is released. It uses the same OS as the Palm Pilot, Visor, and other Palm OS computers, and it looks almost identical to the Palm IIIx, but it has a compact flash slot that will allow you to have more than 300 megabytes of storage. (That is not a typo. I said over three hundred megabytes.) The gadget with 8 megabytes of system memory will cost \$329.99, and you can buy a 128 megabyte flash card for \$369.95.

And that ain't the half of it. Check out <http://www.trgpro.com/> and see the claims being made for this technology.

## Two New Keyboards

Two new portable keyboards are for use with handheld computers. The Targus Stowaway(TM) Portable Keyboard is the world's first full size keyboard that folds to fit in your pocket. The new GoType!(TM) keyboard by Landware includes a USB port that lets you synchronize directly from the keyboard to your desktop (and is available from Office Max for about \$70). Both are also available for sale online at the newly opened PalmGear online store and are flying off the shelves (along with the myriad of other cool modules and accessories--including the new InnoPak 2/V and OmniRemote--you can find at the PalmGear Springboard Module and Visor Accessory Store) so check them out.

[http://p01.com/t.d?NENrR8pW=/hs.palmgear.com/products/accessories.cfm\\_0sid=59440420000417172129.685959841](http://p01.com/t.d?NENrR8pW=/hs.palmgear.com/products/accessories.cfm_0sid=59440420000417172129.685959841)

## 1° Care Exchange

In this Issue... [Electronic Medical Records](#)

Department of Family & Preventive Medicine  
The University of Oklahoma  
Health Sciences Center  
900 NE 10th St.  
Oklahoma City, OK 73104-5499

Non-Profit Organization  
U.S. Postage  
**PAID**  
Oklahoma City, OK  
Permit No. 220



The University of Oklahoma is an equal opportunity institution.

1,200 copies of this publication, printed by The University of Oklahoma Printing Services, have been printed and distributed at no cost to the taxpayers of Oklahoma. (06/00)